

THE IRON AGE

A Review of the Hardware, Iron and Metal Trade.

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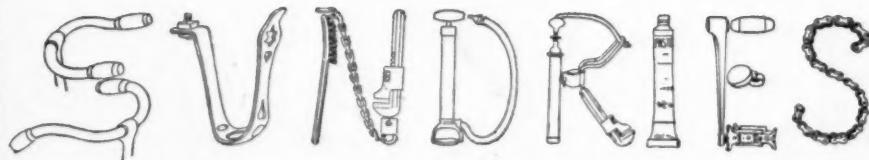
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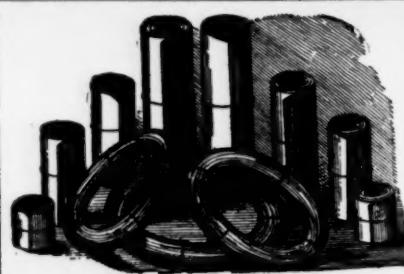
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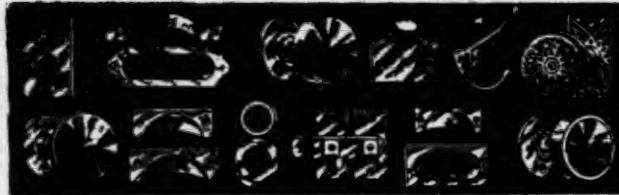
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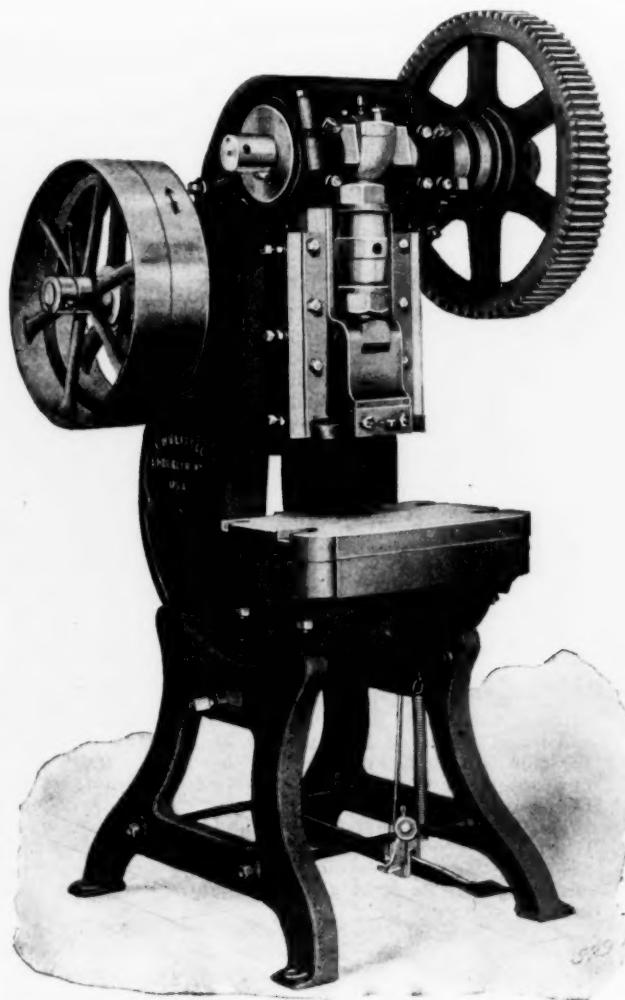
THURSDAY, MARCH 9, 1899.

New Line of Bliss Inclinable Power Presses.

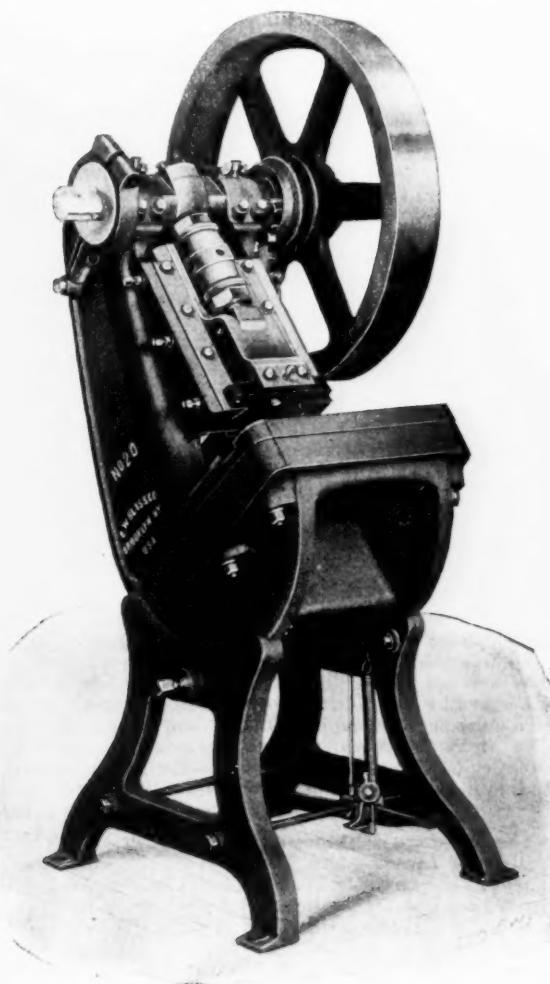
More than 20 years ago the inclinable power press was invented and placed on the market by the E. W. Bliss Company of 11 Adams street, Brooklyn. Since that time many improvements have been made in the details of construction, but the company decided recently to make entirely new designs which would embody all the latest and best ideas in press construction. The result is shown in the accompanying engravings. It will be noted that the "straight line" principle has been adopted. This not

there can never be more than the load of the latch spring upon the latch. Also the "clicking" of the clutch when the brake is set up too tight for ready release, in instances where heavy spring pressure attachments are employed in connection with combination dies, is entirely overcome by this improved arrangement.

The fly wheel is bronze bushed, and the bushings can be easily removed when worn. Two or more clutch locking points are provided, locking the wheel to the shaft the entire length of its bearing. The press frame is so constructed that feeding devices, gauges and other attach-



Geared Inclinable Press, Upright Position.



Press in Inclined Position.

NEW LINE OF BLISS INCLINABLE POWER PRESSES.

only produces a graceful appearance, but also a much more rigid frame, resulting in greater strength with the same amount of metal. The weights have been increased, thereby adding largely to the strength. The slides and gibbs are very long, thus insuring the best results and longest life for dies and tools usually operated in such presses. The shafts are of forged steel, of large proportions and well fitted. The slide connections in the larger sizes are also of forged steel and are bronze bushed. The mechanism of the clutch has been improved, and is claimed to be the strongest and safest in use. The heel of the clutch has been reshaped, and also the supporting bracket for the disk engaging latch. The whole construction now avoids any wedging of the clutch heel and the latch; in fact,

ments can be readily applied. It may also be inclined to any angle which best suits the operator. The press is built in many sizes, both as fly wheel and geared machines, ranging in weight from 300 to 6500 pounds.

A very amusing twist to a simple matter has been given by E. D. Nicholson in a paper on "Chilled Rolls" read before the South Staffordshire Institute of Iron and Steel Works Managers, at Dudley, England. Mr. Nicholson undertakes to prove that the best chilled rolls are made in Staffordshire and disposes of the American product as follows: "Such is the unreliable character of the American roll that it is common practice, where mills are not too large, to have a pair of rolls, housings, &c., all

bolted together complete, so that in case of failure the old set can be lifted out bodily and the new put in without serious loss of time." The fact is that the system has been introduced to save time in roll changing when different sections are rolled, and not because the rolls fail.

The Worcester Machinery Industry.

Manufacturers of machinery in Worcester, Mass., recently visited, report with great unanimity an abundance of orders, and a generally lively condition of business. Many of them have already advanced prices, and others are contemplating doing so.

Prentice Brothers Company are running their shop every other evening until nine o'clock, and report a continuance of foreign demand for lathes and drills and a large increase in domestic orders. They are now employing as large a force of men as their shop room will accommodate and have orders ahead. They have not advanced prices, but state that the tendency is upward, and an advance is probable soon.

The Powell Planer Company are sold ahead until August. They have advanced prices on some sizes 10 to 15 per cent., and say they are getting the advance. Their orders are mostly for intermediate sizes.

The Draper Machine Tool Company are very busy, foreign and domestic orders being about equal. They advanced prices on January 1. During the past year their plant was enlarged, and they are now employing upward of 150 hands.

F. E. Reed Company are running 250 men, and putting in new tools as fast as they can obtain them. They are still behind on their orders, and have already made some slight advance in prices and contemplate others in the near future.

Reed & Curtis Machine Screw Company are busy both on standard work and on bicycle specialties.

The Whitcomb Mfg. Company are running full, and have orders ahead. They have advanced prices a little, and contemplate a further advance.

L. Robbins, lathes, has advanced prices, and reports foreign and domestic trade about equal. He has all he can do at present.

J. E. Snyder, maker of upright drills, is full of orders, especially for the larger sizes, and his home trade has greatly improved. He has advanced prices on whole line.

W. C. Young Mfg. Company are very busy on shears and punches. They have made no noteworthy advance in prices.

The George Burnham Company, drills, are rushed with business.

P. Blaisdell & Co. have more orders than for some time past.

Worcester Machine Screw Company report a large increase in orders, and are now extremely busy.

Worcester people have been approached by a number of firms and individuals desiring to represent them in Cuba and the Philippines, but, so far as could be ascertained, none have accepted the propositions, as it is not generally believed that the demand for machine tools in these, our new possessions, is worth cultivating at present.

The Western Foundrymen's Association.—The next meeting of the Western Foundrymen's Association will be held at the Great Northern Hotel, Chicago, Wednesday, March 15. The following amendment to the by-laws will be considered: *Resolved*, That Article 11, Section 3, be amended to read as follows: The annual dues of each corporation or firm shall be \$10, payable quarterly in advance, but the annual dues of each member not engaged as a manufacturer or jobber in his own name shall be \$5, payable quarterly in advance. A discussion will be had on the best means to be adopted to secure higher prices for castings, in view of the advance in the price of pig iron and other materials. The following topical questions will come up for discussion in their order: What can be said for or against the regular use of softeners in a mixture containing a very high scrap percentage? In disposing of burnt iron profitably how would you do it other than casting into sash weights? What benefit, if any, is derived from adding wrought iron and steel scrap to mixtures for malleable castings? Are such additions discoverable in a proportionate increase in weight of castings? In other words, do you get out what you put in the cupola?

There is a scarcity of puddlers in the Pittsburgh district at the present time, and the Oil Well Supply Company of that city were recently compelled to close down a number of puddling furnaces until a supply of men could be had to operate them. With the high price for billets and the consequent advance in prices of steel bars, there promises to be considerably more puddling done, and it is likely the scarcity of puddlers will not be overcome for some time.

Progress at the Paris Exposition.

BY A. H. MATTOX.

Major Fred Brackett, secretary of the United States Commission to the Paris Exposition of 1900, who has charge of the New York offices of the commission, reports that rapid advancement is being made on the buildings and grounds of the exposition in Paris.

The vast masses of iron, steel and stone that a few weeks ago had a meaning alone for architects, builders and engineers are beginning to take form and shape and appeal to the public eye with their symmetry and beauty. The strike in Paris last fall interfered only slightly with the progress of the great fair. Commissioner General Picard and the numerous contractors, both for the palaces and buildings and for the wonderful Alexander III bridge across the Seine, are all confident that the exposition of 1900 will be ready on time, and that the gates will be opened to the public on April 15 of that year. In fact, the French commissioners have stated officially that they are fully satisfied with the rapidity with which the work is advancing in all sections of the exposition.

The roofs of both Palaces of Fine Arts are about completed and for the next few months the decorators, sculptors and artists will have full swing in the work of painting and the embellishing of the interiors of these buildings.

Work on the Trocadero grounds is progressing rapidly. The greater part of the masonry for the various palaces to be erected on the Place des Invalides has been completed and work on the Alexander Bridge across the Seine, which is to connect the Champs Elysees with the Place des Invalides, is advancing rapidly under the supervision of its engineer.

The funds invested so far in the Paris Exposition amount to \$6,600,000. Of this sum about \$5,000,000 was expended in 1898. The city of Paris has already contributed \$2,400,000 of the \$4,000,000 promised, and \$500,000 has been contributed by the Western of France Railway. So in the midst of political changes and many alarms the French authorities are steadily pressing forward in their preparations for the great exposition, which is to be the distinguishing feature of the dawn of the new century.

The space to be occupied by the exposition is about 360 acres. Of this amount the French Government has allotted about 60 per cent. for all other nations, reserving about 40 per cent. for themselves. The space thus far secured by Commissioner General Peck for the United States is about 222,000 square feet.

The main entrance to the exposition will be located at the extreme northeast corner of the grounds, at the place where the Quai de la Conference adjoins the Place de la Concorde. This monumental entrance to the exposition is now being rapidly constructed. It takes the form of a triumphal arch, surmounted with a frontal bearing the arms of the city of Paris, which serves as a pedestal for a colossal statue of Liberty. M. R. Binet is responsible for this triumphal entrance, which will be a masterpiece of decorative architecture. The two friezes on either side of the arch represent "workmen carrying the produce of their labor to the exposition" and are designed by M. Guillot. The cost of this magnificent monument will be \$300,000. By an ingenious device the ticket office to this entrance will be arranged to admit 60,000 persons per hour.

On the quai which extends along the north bank of the Seine lies the Champs Elysees, in a part of which was held the exposition of 1855. The Palais de l'Industrie, which was the principal building of that exposition, has been demolished to make room for the two Art Palaces, which are to be known as the Great and the Little Palaces of Fine Arts. They will cost about \$4,500,000 and will remain as permanent embellishments to the city of Paris. These new Palaces of Fine Arts will be two of the most modern and useful buildings of their kind in existence. The Grand Palace will be utilized during the exposition as the Palace of Fine Arts. In the way of sculpture, painting, architecture and drawing it will probably surpass anything the world has ever seen. The masterpieces of fine arts of the century and the productions of the last decade will be housed in this palace. In the smaller building will be displayed the retrospective exhibition of art. Work is now being pushed on these palaces night and day.

Across the Seine, joined by the new Alexander III bridge, lies the Esplanade des Invalides. This tract extends from the Seine to the Hotel des Invalides, and here will be located the great building of General Manufactures. This building will be the largest at the exposition, and in architectural design most elaborate. Near the Manufactures Building will be the Education Building and numerous minor structures. On the south bank of the Seine is the Quai de Orsay, in which will be the pavilions of all foreign nations, also the Army and Navy Building. On the north bank of the Seine will be located the buildings of Horticulture and Agriculture. In the Trocadero

grounds will be located the colonial exhibits, both of France and other nations.

The building devoted to electrical industries will probably play the most important part of any at the Paris Exposition. It will be located across the River Seine from the Trocadero Park. In this building there will be a huge central generating plant, with thousands of motors distributed all over the exposition in every department. The building, a capacious one, is designed for both ornament and usefulness. It is square shaped, with a cupola at each corner, and the main part is a mass of delicate ornamentation. At night when ablaze with electric light it will be the center of attraction and will present a scene of great beauty. In the central courtyard of the building will be an electrical fountain with a series of cascades, all brilliantly illuminated by vari-colored lights. On the exterior of the palace will be innumerable electric lights of various shades, colors and devices. Crowning all, on the topmost pillar of the building, will be a mass of flashing electrical flame forming a statuesque group, designed by a famous European artist. The Palace of Electricity will be devoted to an exhibit of electrical machinery and the thousand and one inventions to which electricity has been utilized. The demand for space from the United States for the Department of Electricity far exceeds that which Commissioner General Peck will be able to give.

To the west of the court on which will stand the Palace of Electricity will be located the buildings devoted to Chemical Industries, Transportation and Civil Engineering, Liberal Arts and Instruments, Letters, Arts and Forestry.

On the east side of this same court will be the Machinery Building, the buildings of Mines and Mining, of Navigation, and the Textile Building.

American electricians will be much in evidence at the exposition, as it is estimated the manufacturers of electrical machinery will expend over \$1,000,000 in their exhibit in 1900. American artists, too, will be well represented, and the products of the earth, agricultural, horticultural, forestry, fisheries, food stuffs, textile fabrics, mining and metallurgy, will all receive complete attention from American exhibitors. The United States will also have an immense department of hygiene and one of public and organized charities.

The need of space is so great that $2\frac{1}{2}$ acres of ground have been made by the French commissioners by filling along the banks of the Seine. The gardens and terraces on each side of the river will be utilized and exhibits will be made on each side of the River Seine.

As the exposition will occupy so much space on the Seine it will be necessary to build several foot bridges across the river. One foot bridge will be situated near the Pont des Invalides, which will be built entirely of iron, decorated with electric lamps disposed in groups forming luminous flowers. The pillars supporting the bridge will also be brightly lit up, adding a fine effect to the exposition at night. Another foot bridge will cross the Seine near the Pont de l'Alma. It will be constructed of barges supported by pilasters decorated with maritime symbols. Still another suspension foot bridge will cross the river in front of the Palais des Armees de Terre et de Mer.

The municipality of Paris will do all in its power to make the city look more beautiful than ever in 1900. The Municipal Council has already sanctioned the outlay of large sums of money for the rearrangement of many public gardens and squares and for the brushing up and cleaning of numerous monuments. The Bois de Boulogne, one of the finest promenades in the world, will be improved at great expense.

It is more than likely that horse traction will disappear in Paris during the exposition year, in the way of omnibuses, tramways, cabs and carriages, electric motors taking the place of the horse. It is estimated that more than 10,000 horseless vehicles will be in use in Paris in 1900.

Hon. Ferdinand W. Peck, Commissioner-General to the Paris Exposition of 1900, who is in New York, speaking to *The Iron Age* of the importance of the participation of the United States in the coming event at Paris, said: "I desire to call attention to the fact that the United States' exhibit is not to be made for the benefit of the French people. The location of the exposition in Paris is but an incident: the eyes of the whole world will be upon us on that occasion in the great metropolis. Our contemplated part in the exposition has a twofold purpose. 1. There will be assembled in Paris the exhibits of 57 nations and the representatives of 500,000,000 consumers. Millions of people, coming from all parts of the world, will visit the exposition. It will be the great opportunity in our history to present our resources and products to all these people, with a view to increasing our export trade. In my judgment every \$100,000 expended in the creation of our display will bring millions in return to our producers and manufacturers. 2. Our national pride, as well as our national interests, demands that the United States, the greatest of all, should be a prominent participant among other nations at that international exposition. The American people certainly

do not desire that we be absent from that great event or that we shall not be represented in every group by the best possible display that our allotted areas will permit." From careful observation on the ground in Paris Mr. Peck says that he thinks that France has been and is friendly to us; yet were it otherwise it is our manifest interest and duty to appear in our best garb at the coming exposition for the reasons above mentioned, not to benefit France but ourselves. Our national pride demands that the great United States of America should stand alongside of her sister nations grandly displaying her arts of peace.

The Foundrymen's Association.

The regular monthly meeting of the Foundrymen's Association was held at the Manufacturers' Club in Philadelphia on Wednesday, March 1, the president, P. D. Wanner, occupying the chair.

The Executive Committee's report referred to the absence of profits to foundrymen on business undertaken during 1898, and to the discussion on the subject which formed part of the proceedings of the last meeting of the association. Since that meeting, the report stated, the committee had found one or two foundrymen who had profited by the lessons arising out of that discussion, and had absolutely refused to renew some of their orders at former prices, notwithstanding that the customers insisted that the prices formerly paid were higher than had been offered by other founders. This evidence of backbone resulted in a higher price being obtained, and the patterns remaining at the foundries. The customer in the market for castings understood the situation, and used the name of one foundryman as a club with which to knock the other foundryman down; and as there was no understanding existing between foundrymen in general such a state of things might continue indefinitely. With pig iron and raw material advancing the foundryman was entitled to at least the difference in the cost of his castings, but from timidity he did not ask an advance, fearing his competitors might get the patterns he had held contracts on. The report further emphasized the importance of foundrymen demanding higher prices, and the belief of the committee that they could be easily obtained.

The chairman, in commenting upon the report, drew attention to the danger threatening foundrymen who had taken low priced contracts and had failed to cover them by purchases of pig iron. The strong advances in the pig iron market to-day, he said, were equivalent to those made in the same market during the exciting period of 20 years ago. History generally repeats itself, he said, and who could say that something of a repetition of those times might not be experienced? Of course, things had changed very much since then, but he would not be surprised to see some grades of pig iron go up to \$25 per ton. The fact that prices had advanced was not the only thing in the situation. A most serious question was that it was difficult to book for prompt delivery at any price. If any one doubted that let them go into the market and try to buy. If much work was taken now by foundrymen for delivery within the next two or three months they might find themselves in a fix, unless their supply of pig iron was assured. The funniest thing about the situation was that in spite of the scarcity of iron, and a material advance in the price of it within the past year, the prices of castings had not advanced to any extent. This would apply to all branches of the foundry trade. Foundrymen were certainly entitled to better prices from a market standpoint, and the subject was worthy of profound reflection.

The secretary reported a desire on the part of certain members of the association to get the association to take up the question of credits for the protection of its members. It had become quite a common thing, he said, for unscrupulous persons to run up a heavy bill for castings with one foundry, and when defaulting in payment open an account with another and so on. He instanced a case where four foundries had suffered from one such customer. Various ways and means of notifying foundrymen of such dealings were discussed, but the matter was finally referred to the Executive Committee.

F. A. Riehle, Riehle Bros. Testing Machine Company, Philadelphia, then read a paper on "Testing Machines," illustrating the same by a number of lantern slides.

Secretary Evans showed several lantern slides descriptive of the Farquhar pulley molding machine, shown elsewhere in this issue.

Contrary to the general expectation that American capital would eagerly seek investment in Cuba and Porto Rico, following the American occupation of those islands, the officials of the War Department at Washington state that, so far, surprisingly few applications have been filed for grants, franchises or concessions for the establishment of new enterprises or the construction of public works. Not more than a dozen requests for such privileges have been entered in Cuba and less than that number in Porto Rico.

British and American Machine Tools.

The correspondence on British and American machine tools which has taken place in these columns has been both instructive and interesting, but it has failed woefully in an unexpected quarter. We hoped, we anticipated, that a subject of such great importance would be entered into with some degree of spirit by those most immediately concerned in it. But, with few exceptions, the cudgels have been taken up entirely by machine tool makers, and that principally, it would appear, with the object of belaboring the one user who was sufficiently unapathetic and alive to his own interests to speak out his mind about machine tools.

This apathy of the masters has opened quite a new phase of the question. The weak points of English machine tools have been pointed out, and the fault has been ascribed to the maker. It is only recently that we have found, partly from the weak spot in the correspondence to which reference has already been made, and partly from

more determination to succeed against odds, unless there is more keenness, more activity than there was before the great dispute; unless the weakness of which the shadow fell upon our correspondence, and to which we have alluded in these few sentences, is entirely overcome; unless the carelessness which leaves too much power in the hands of a foreman who is more often than not in sympathy, perhaps even in league, with the workman, is a thing of the past, the efforts of the machine tool makers, when they, too, awaken to the fact that a wonderful change has taken place in the conditions under which their productions are employed, will be useless and disheartening. The fault was threefold. It began with the men, went on to their employers, and finished with the machine tool makers. The foundation has been knocked from under it. There must be chaos for a time; there are old ways to get out of, old inept servants to dispose of, old prejudices to smother; but from the wreck there is every opportunity and possibility of building a commanding edifice. If the users and the makers would but work hand in hand, we know of a certainty that the rung of the

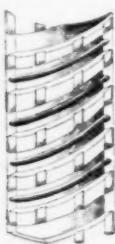


Fig. 1.—Skeleton Bronze Lining for Car Axle Box.

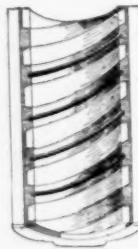


Fig. 2.—Finished Car Axle Box.

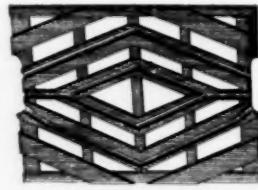


Fig. 3.—Skeleton Bronze Lining for Motor Box.

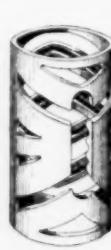


Fig. 4.—Skeleton Bronze Lining for Motor Box Formed Ready to be Placed in Retaining Shell.

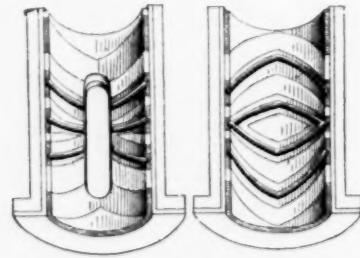


Fig. 5.—Finished Motor Box Half Sections.

SPIRAL JOURNAL BEARINGS.

ladder upon which the American machine tool maker has placed his foot would break under him.—*London Engineer*.

Spiral Journal Bearings.

In the spiral bearing for car axle boxes a cast steel shell (practically indestructible) is used in which is placed a skeleton lining, made from a bronze metal prepared with a view to its wearing properties. The babbitt or anti-friction metal is then poured the same as with lead lined boxes. The metals are firmly imbedded and interlocked, and reveal a bearing surface composed of the two metals in a spiral form, alternating the one with the other. Hot boxes are not infrequently caused by imperfect lubrication where the bearing has been worn to the full arc of the journal, in which case the edges or sides of the box are brought so closely in contact with the journal as not to admit sufficient oil. To remedy this defect by furnishing a more perfect lubrication and also to free the bearing of all foreign matter is the object of the oil grooves used in the bearing made by the Spiral Journal Bearing Company of St. Louis, Mo.

These bearings for electric railway motors, dynamos and high speed machinery, where the lubricant is applied through a dope hole, the lining is so constructed that the oil is carried by grooves toward both ends of the box and then brought back to the center. The design of the bearing will be understood from the accompanying drawings.

The first automobile ambulance ever constructed in this country has just been presented to the Michael Reese Hospital, Chicago. It was built in that city and weighs 1600 pounds. Its speed approximates 16 miles an hour.

One manager would object to it because it was unsuitable for all jobs, another because two tools were used, a third simply because it was unknown. At every turn there was objection and disappointment, the lack of energy of the masters and the active hostility of the managers practically arrested the development of a system of which use is daily proving the efficiency.

This is a single example, but it does not stand alone. The same opposition to improvements which killed this particular device has been the death of others. The listlessness in many cases of the masters, the passive opposition of the foremen and the active antagonism of the workmen, have been, it would appear, a far more potent cause of the neglect of machine tool construction in this country than we had imagined possible. Of course we all know that the automatic machine had practically no chance of success as long as the employers allowed the men to be masters. Since the improved conditions commenced, machine tools, in the hands, too, of untrained men, do things they never did before, and leave undone many of those things which they were wont to do. The continual supervision that was needed when any labor or time saving device was introduced some years ago is no longer demanded; a laborer "off the floor" does more now than the trained hand ever did. Machines marked down by the union were always failures. The comparative success with which certain tools, particularly the milling machine, met, has been ascribed, and probably with correctness, to the fact that they have not been allocated by the union.

The masters have awakened. They have gained a position which should have been theirs from the first, and they have in a measure profited by it. But unless there is

Illinois Steel Portland Cement.

The Illinois Steel Company of Chicago have broken ground for the erection of a plant to produce Portland cement which is to cost \$300,000. The plant will be located in the immediate vicinity of the company's blast furnaces at South Chicago, for the purpose of utilizing the slag. The process used is the invention of Jasper Whiting, manager of the company's cement department. A plant operated under this process has been running to its full capacity at the North Chicago works of the company for the past three years, turning out over 500 barrels a day, for which a market was easily found. The success of the process having been thoroughly demonstrated and the satisfactory quality of the cement having been proved by the increasing demand for it, the company have decided to erect one of the largest cement plants in the country, to have a daily capacity of 1500 to 2000 barrels. The process which is used is described as follows:

The Whiting Process.

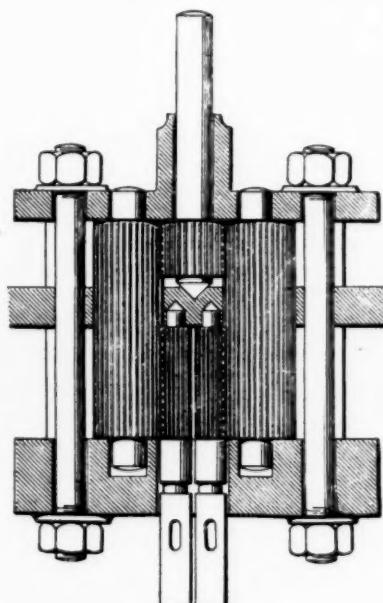
"The slag as it comes from the blast furnace flows into an open trough which terminates above a large tank of water. Immediately below the end of this trough is a nozzle connected with a steam pump, capable of throwing a large body of water against the stream of molten

that at least 95 per cent. of it will pass through a standard sieve containing 40,000 meshes to the square inch. The material which comes from the tube mills is the finished cement. It is packed mechanically into barrels and bags for the market, emerging under the trade name of Steel Portland cement. While cement has been manufactured in European countries out of blast furnace slag for many years, little has been put upon the market that has not been open to severe criticism. This has been mainly due to two causes—namely: 1. Its irregularity. 2. Its slowness of setting.

"The first difficulty arises chiefly from the fact that the slags of Europe are of themselves not at all of a uniform composition, the ores from which they are made being of a very low grade. With the Illinois Steel Company the process of manufacturing cement begins at the ore mines and not at the blast furnace. Their ores are pure and regular. The resulting slags are therefore of a uniform character, and great care is taken to select only those of a composition best suited to the manufacture of cement. Before the slag is used each lot is submitted to a careful analysis and all material not of the correct composition is discarded.

"The second difficulty, that of slow setting, is overcome by patented as well as secret improvements in the process, making it possible to control the time of hardening of the finished product so that it will fulfill the requirements of almost any class of work. It will be noticed, therefore, that though the process is somewhat similar to that employed abroad still it differs from it in very essential details, and the resulting cement is a much superior article."

Hitherto the cement made by the company has been a concrete foundation material, for which work it is guaranteed. It has been used in some of the largest concrete jobs in the country, notably in the construction of the New Orleans drainage canal tunnel, which alone has taken over 35,000 barrels. With the new plant it is proposed to make not only the same class of material as heretofore, but an improved cement for use in exposed work and suitable for any purpose to which the imported cements have been considered especially adapted. It will probably be late in the summer when the new works are completed and put in operation.



BORING HOLES NEAR TOGETHER.

slag, at a pressure of 80 pounds per square inch. This contact between the slag and the cold water not only causes the slag to break up or granulate, but changes it chemically in such a way as to render it suitable for the manufacture of cement.

"The chilled slag is then conveyed into rotary dryers, where it is deprived of its moisture, and thence passed into a hopper placed above a row of Griffin mills. The material in passing through the Griffin mills is ground to a very considerable fineness, and is then conveyed by means of an elevator to hoppers placed over a row of Davidsen tube mills. These tube mills accomplish two purposes, grinding the material to a fineness unprecedented in the manufacture of cement and at the same time intimately mixing the various ingredients. They consist of horizontal cylinders about 4 feet in diameter and 16 feet long, lined with porcelain tile and containing about one-half their volume of flint pebbles. These pebbles are culled from the sea coast of Norway, are egg shaped and vary in size from 1 to 2 inches in diameter.

"The mills make about 27 revolutions per minute, and the grinding and mixing are effected by the continuous rolling of the pebbles within. The slag and previously prepared lime and other ingredients are delivered to the mill through a trunnion at one end and come at once in contact with the pebbles, traveling the length of the cylinder until discharged from the periphery at the other extreme.

"The fineness of the product varies with the amount of material conveyed into the mill in a given time, and as this is entirely under control the product may be brought to a degree of fineness desired. In fact, upon this one point the high quality of the cement is very largely dependent, and no product is shipped which is not so fine

Boring Holes Near Together.

Where it is required to bore two holes of small diameter quite near together (as, for instance, in bicycle chain blocks, where two 5-mm. holes must be only 10 mm. between centers), it is sometimes rather difficult to get both bored at one operation and both parallel and at the precise distance apart.

It can be accomplished by driving a left handed spiral drill direct from a right handed one by very wide faced steel gears shrunk or pinned on the drills, the axes of the gear and drills passing through two flat plates which hit against a stop piece, so that the left handed drill only rotates on its own axis and does not revolve about that of the right handed one. This rig has the disadvantages: 1. That left handed drills are a nuisance about the place (besides costing about 10 per cent. more to make), and, 2. that the pressure on the two drills is unequal, the right handed one getting the thrust of the spindle direct and the left handed one not.

Another way of doing the same thing is as shown in the sketch—where two right handed drills are used, each driven from a gear parallel to and outside (as one might say), these two gears being a trifle more than double the diameter of those on the drill shanks, and being driven by one between them, of the same diameter as themselves, which is on a shank that fits directly into the socket of the drilling machines (or into the chuck, whichever is used).

In either of these rigs it is advantageous to make each of the two very wide faced gears in two parts, butted together end for end, so that a tooth broken or worn at one end may be more cheaply repaired or replaced.—*Railroad Gazette.*

The directors of the Illinois Steel Company elected the following officers last week: E. J. Buffington, president; Charles H. Foote, first vice-president; T. J. Hyman, secretary; William H. Thompson, treasurer; James Sim, assistant secretary, at New York; C. P. Coffin, assistant secretary and assistant treasurer, at Chicago. Executive Committee: E. J. Buffington, Marshall Field, W. L. Brown, Robert Bacon, C. C. Cuyler. After the meeting of the board, the Executive Committee met and elected W. L. Brown as chairman of the Executive Committee. If any fiscal statement is published it will be given out by the Federal Steel Company.

The Western Soil Pipe Association met in Milwaukee, Wis., on the 3d inst., and resolved to advance the price of iron pipe 5 per cent.

Lake Iron Ore Matters.

The continued rumors of purchases of mines by the leading steel interests have kept the mining region in excitement for the past two weeks. Most of them are untrue, but there seems good reason to believe that some are facts, especially that connecting the big properties of the Lake Superior Iron Company at Ishpeming with one of the newest combinations. The mines of the company would be especially valuable to the supposed buyer for steel making purposes.

Among the late sales of ore is said to be one of some 30,000 tons of Roberts, a new mine on the Mesaba, to American steel and wire interests. This is the only siliceous ore mine on the Mesaba, and the sale is an interesting one. Roberts will mine this year about 60,000 tons. The Fayal, Mesaba range, has formally closed a lease that has been expected some time, that for a piece of land adjoining the mine, on which a large amount of ore exists and which is already under improvement for mining this year. Leases for an addition to the Sparta mine, which is now in the hands of Pickands, Mather & Co. of Cleveland, have also been filed. The Commodore mine is bailed out and mining is beginning there, while the Franklin will be at work very soon. The Auburn has started up for the year, and new methods are to be introduced in the employment of a steam shovel at the bottom of the milling pit, where there is a chance for the shovel to load cars from the ore right on the tram tracks. From the shovel the cars will be trammed to the shaft as the milled ore is and hoisted to the surface. The idea is a novel application of the steam shovel in mining. At the Sparta mine two drills are working in a great horse of rock that protrudes in the ore to see if ore may be found under it. Drill work at the town site of Eveleth has been carried so far that the operators are sure of their ground and know they have a large mine. They have offered to remove all buildings on the location to higher and non-mineralized ground close by free of cost, and to give each owner a new site corresponding in size and location to his old; also to lay water mains in two streets, grade and macadamize two main streets, build sidewalks, put in sewers, and in short to make the town a good deal better than it was before, and all without expense to the village or its property holders. All of them will doubtless sign the agreement and the town will make its peregrination in a short time. Included in the buildings to be moved are several large structures, hotels, banks, stores, &c. The land on which the new mine is located is owned by the same parties, Michigan lumbermen, who own the fee to the Adams, Cloquet and part of the Fayal mine. These all lie in the immediate vicinity.

The new docks of the two leading Minnesota ore roads are both progressing. They will consume nearly 9,000,000 feet of timber of various descriptions and will give the roads pre-eminence, the Duluth & Iron Range for having the greatest dock capacity of any mining company in the world, the Duluth, Missabe & Northern for the two largest ore docks in existence. D. & I. R. Road is in the market for 400 ore cars, and other lines to the mines expect to add to their equipment.

Gogebic affairs are active and getting more so week by week. Now the real estate market at Bessemer and Ironwood, too dead to skin for the past six years, shows life and transfers are becoming numerous. Even Hurley is looking up. There the Superior and Carey mines, idle for some time, are being unwatered and will be in the active list as soon as possible. Mikado, that never shipped but in 1895 and 1897, will be reopened under the auspices of the Lake Angelina Company. Brotherton people expect to absorb the Chicago mine at Wakefield and to open it. Half a dozen other idle properties all along the range are under negotiation for resumption, and it is safe to predict that every mine on the Gogebic from which ore can be taken at reasonable cost will be working as soon as arrangements can be made for it. But this is true not alone for the Gogebic, but of every one of the five ranges, and there will be a good deal of surprise to those who figure that the only shortage of ore this year will be that caused by the inability to mine enough to supply the demand.

On the Marquette range the sale of the Lake Superior is the sole item of large interest just now. The company have ordered a second Gates ore crusher, to be placed at their hard ore mine, and to be ready at the earliest date possible. The first of these immense crushers has proved a great success. Lands adjoining the Queen group have been bought for immediate exploration.

The advance in neighboring copper stocks and the great increase in demand for iron ore have combined to add to the value of iron stocks, and they have started on the up grade, some of them notably so. Lake Superior has gone to \$30, Cleveland Cliffs to \$60; Republic, which was of no value not many seasons ago, is now \$15; Chandler, that paid a 40 per cent. dividend lately, is now \$43, with par \$25; Rockefeller mine, that three months ago was \$25, is now at \$40, and others in proportion. Even a lot of the old cats and dogs of the Gogebic are changing

hands quietly, at low prices of course, but still showing a movement that is an indication of the way the wind blows. It would be strange if these iron stocks did not advance before long, considering their surroundings and the advance in all other lines.

The Western legislatures are at work with the mineral interests as usual, and as always are getting all tangled up with ridiculous propositions. In Minnesota a considerable tangle was brought about by efforts to prove that the State school fund stood to lose the vast sum of \$15,000,000 by the machinations of the iron companies if the iron ore rates from mine to lake were not reduced forthwith by one-half. There was no particular connection between the two ends of the proposition, but it brought the educators of the State, who don't know much about its mines and mining concerns, to their feet. State Auditor Dunn, whose position as watchdog of the public funds is that of exceeding vigilance, who is in fact the only State auditor Minnesota ever had who considered himself in duty bound to look out for the interests of the people who elected him and not of a few friends, cannot be regarded for a minute as unduly friendly to the mining companies. He said to your correspondent that so far from there being a possibility of the State's losing such an amount the State's entire interest in the county containing the mines, interests of both pine and iron, there is not a value of over \$5,000,000, and none of this can be taken away. In Michigan resolutions have been introduced calling for specific taxation on mines to the extent of 60 cents a ton on iron ore and \$20 a ton on copper. This would mean a revenue to the State of about \$6,000,000, probably enough to carry on the State machine twice over! Minnesota has killed the proposition for a State bounty of 50 cents a ton on pig metal made in the State of Minnesota ores, Wisconsin has one still pending covering the manufacture of pig from any ores, and Michigan has one for the manufacture from State ores, the amount of the bounty to be \$1 a ton. Both of these will probably die. To the manufacture of charcoal iron, if the Ashland experiments succeed, will these States be obliged to turn if they hope for the smelting of ores in their own confines. The Ashland experiments will, therefore, be watched with the deepest interest.

The outlook for the year in the lake mining regions seems almost beyond belief, especially to those who had watched the conditions of 1893 and 1894, when men were willing to work for 75 cents and \$1 a day, and, except in rare instances, could not get even that. That was about the time when many of the heaviest men in the financial and business world thought there would never be a demand for iron ore any more, and that to talk of an increase over the production of the preceding year, 9,000,000 tons, was to talk of matters in the highest degree absurd. Then mines were closed, railroads were practically idle, men were hungry, towns were abandoned, business was dead. The stocks of valuable mines that had been dividend paying sunk out of sight and had no value. They were put away and forgotten.

Never have there been such active times in the mining towns of the five great iron ore ranges as to-day. Most of them are overcrowded, and the sound of the hammer and saw is the prevailing music. Improvements are the order of the day, business men are increasing their stocks, and are having as much to do as they can comfortably attend to. While attention has been directed away from iron mine stocks and securities toward copper and Eastern investments, the mine shares have gradually advanced, and in many cases are now selling at from 30 to 40 per cent. more than last fall. Mines that have been idle for a score of years, that have filled up with water and whose very existence has been forgotten by many, are being pumped out and reopened to add to the mineral output of the coming season, and many a village whose sole support was these mines has wakened from a sleep of years and found itself once more on the road to prosperity. This is especially true of the Menominee range.

In 1892 the mines sent out an unprecedented amount of ore, 9,000,000 tons. After a drop the succeeding season of 30 per cent. they in 1895 surpassed the record and touched 10,500,000 tons. Last year the amount shipped was 14,000,000 tons. If all present signs do not fail the coming season will close with shipments double those of 1892. By the end of the coming shipping season nearly, if not quite, 18,000,000 gross tons of iron ore will have been mined and shipped to the East from the ranges of this State and Michigan. It took all the years from the beginning to 1882 to equal this. The most careful estimates now obtainable indicate that Minnesota alone, that last year shipped 5,900,000 tons, will this year ship 8,000,000 tons. As a matter of fact it may be said that the tonnage of the year will only be limited by the capacity of roads, ships and docks and labor at mines. The mines are capable of making a greater output than can be handled, if they can get men. The roads are spending large amounts of money for additional equipment, about 500 ore cars and a large number of locomotives having been ordered within the past few days, and the two leading Minnesota roads are

now spending about \$500,000 for new docks. The Lake Superior & Ishpeming, running from the mines of the Marquette district to the lake, is practically rebuilding much of its line, and large sums are being spent by the other roads that carry ore. Lake yards are building 15 ships for the ore trade alone, at a cost of over \$3,000,000. Most of these vessels are of a size to carry from 7000 to 8000 tons at a load, and all are of the most modern and substantial construction. Ore dock managers at Lake Erie receiving ports are intending to run their docks day and night all summer, something that has never been necessary before, and they have been busy increasing their general facilities also. Railroads running from these docks to the furnaces of the valleys and Pittsburgh are also increasing their handling facilities to make them in the highest degree efficient, all confident that the greatest year in the history of the trade awaits them.

Under the ore price schedule the finest grades of Minnesota ores are selling for about \$3.55 a ton, and the best of the Mesabas bring only about \$2.40. So great has been the scramble for ore that inferior Mesabas have this week sold for as high as \$2.45, or 5 cents higher than the price set for such a standard ore as Fayal. It is perfectly safe to predict that before the close of the coming shipping season the better Mesaba mines can sell what ore they have not already placed at as high as \$3 a ton. There haven't been such prices as this since the Mesaba became a factor in the trade. Of course, this means better pay for labor, better prices for goods, better times and more prosperity than ever in the northern part of these States.

Labor at the mines is earning more money than it has done at any time since ore was worth double the present prices. Lake rates have steadily declined all these years, and are the same to-day that they were a year ago. This in spite of the now evident shortage of tonnage for the year. It is more than probable that what is known as wild tonnage will advance later in the year just as ore will, but the rail rates will remain unchanged, with a tendency, from year to year, to gradually decline.

Most conservative estimates for the year, based on what sales have been made, what ore tonnages taken by

ter of Menominee output. There were 66 active mines last year; there will be 80 this season.

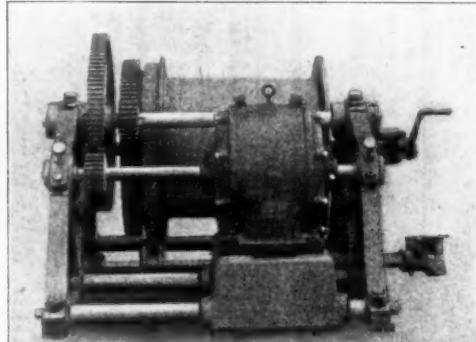
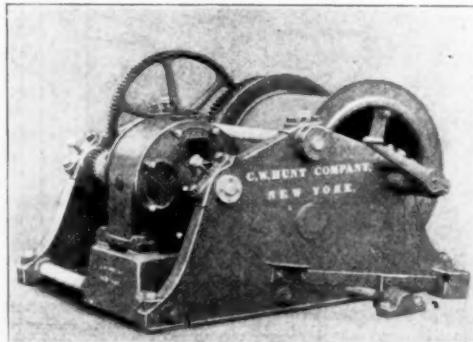
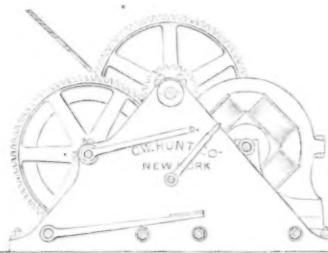
D. E. W.

DULUTH, March 5.

The Hunt Electric Hoisting Engines.

The engraving, Fig. 1, illustrates one of the many sizes of electric hoisting engines built by the C. W. Hunt Company of West New Brighton, N. Y. It is designed from start to finish to be an electric hoisting engine and not a modified steam hoist with a motor attached. These machines are built for high, moderate and low hoisting speeds and properly proportioned for any load and speed desired. The bearings are supported by and are solid with the heavy side frames. Each is bushed with a phosphor bronze bushing which can be readily replaced, as they are all made on the interchangeable system. At one setting the side frames are faced and bored for the bearings and the distance bars, insuring absolute alignment. The machine throughout is built to gigs and templets, and in no way is the work dependent upon the workmen's measurements. As seen by the illustrations, the armature shaft runs in bearings on the main frame in such a manner that the pinion is not overhung but is supported by the bearings, making a very stiff and smooth running machine.

In the construction of the machine the armature is



THE HUNT ELECTRIC HOISTING ENGINES.

mining furnacemen, and the general outlook indicate about as follows for the year:

	Tons.
Mesaba range	6,100,000
Vermillion range	2,100,000
Gogebic range	2,600,000
Marquette range	3,000,000
Menominee range	2,800,000
Total shipments	16,800,000

This is likely to be under rather than over the fact. The Marquette range is set down at less than its 1898 production, but last year it shipped a lot of ore that had been in stock for years. This year there are no old stock piles, and all ore shipped must be mined fresh. It is doubtful if the big companies will make as big an output as last season. The Gogebic is given no increase, though it is likely to make one, and the Menominee is not put down for the enlarged production that its reopened mines would indicate it might give. The greatest relative increase is from Vermillion, where the Oliver Company will ship 700,000 tons. The Chandler will go into spring with 500,000 tons in stock, and will achieve an output of 900,000 tons for the year. The Minnesota will ship 500,000. On the Mesaba Fayal will lead with 900,000 tons or more, Oliver and Mountain Iron are good for 750,000 each, Mahoning 650,000, Biwabik and Adams 500,000 each. These are all big figures, but are likely to be reached. Norrie and Tilden will raise half the Gogebic output, Lake Superior and Cleveland Cliffs 600,000 to 700,000, Lake Angelina 350,000 and Chapin will alone furnish one-quar-

tered by its shaft in the bearings, after which the fields are adjusted accurately to the armature and then fastened rigidly to the distance bars. For this reason the machine when received is ready to go to work and needs no setting up, in the ordinary sense of the word.

The hoist shown is operated by a friction clutch, which is so designed that there are no strains tending to spread the frames. In other words, the device is self contained and is shipped in one piece. A differential brake is used, assisting the engineer in its application and requiring very little physical force in its operation to hold and lower the load. The oiling devices have been very thoroughly worked out. Each bearing has an oil reservoir of its own.

Execution was issued last week in the Court of Chancery at Trenton, N. J., directing the sale of the property of the Hudson Tunnel Railroad Company, under a judgment for \$3,916,894 secured by the Farmers' Loan & Trust Company of New York City as trustee in foreclosure proceedings for money loaned on mortgage and unpaid interest from 1892. The company were formed for the purpose of constructing a tunnel under the Hudson River between New York and Jersey City.

An advance in wages has gone into effect at Ishpeming, Mich., affecting 3000 men in the mines of the Lake Superior, Cleveland Cliffs and Lake Angelina companies. The pay of contract miners under the new schedule varies from \$2.50 to \$3.50 a day.

The Capitaine Petroleum Engine.*

Petroleum engines have thus far been used mainly in small powers, which may be estimated at about four horse-power. In most cases they are operated by inexperienced attendants, in a manner habitual in cases where knowledge of the subject is lacking. Combustion of petroleum, however, requires special devices to insure efficiency in a motor, which include the possibility of derangement and require the acquisition of numerous manipulations. Nowhere is it more true that little can be achieved with limited means than in an oil engine. Such an engine is essentially composed of a jacketed cylinder cooled by water, a piston and crank mechanism, a fly wheel, a combustion chamber with inlet and exhaust devices, an exhaust regulator, an oil vessel with admission regulator, a heating device, either only initially effective or permanently so, or an electric igniter in place thereof, a speed governor, one or several lubricators of the numerous bearings and a sound deadener for the exhaust.

Under present conditions of service none of these details can be dispensed with. The effort to simplify the

running light. This is especially the case when combustion produces a deposit of carbon, which destroys the cooling effect of the jacket. In the better oil engines the layer of soot does not exceed 1.50 or 1.25 inch. In those motors in which the oil is evaporated without the combustion chamber, and drawn in mixed with air through the admission valve, the deposit of oil is greater and generally so material that the walls appear to be moistened by oil, which issues during combustion and exhaust as vapor. In this case experience has shown the consumption of oil to be greater than in those engines which evaporate and mix within the combustion chamber; the exhaust gases also contain more oil and the smell is stronger. The difference of internal temperatures has the further great disadvantage that the point of ignition of the mixture does not remain the same, because of the varying deposit of oil, and of the difference in temperatures of the gases of combustion remaining in the chamber, producing premature or delayed or even interrupted ignition. Proper arrangements can, of course, insure nearly equal internal temperatures; injection of fresh air may prevent variations of temperature of the residuum; the deposit of oil may be minimized, and higher compression and a better ef-

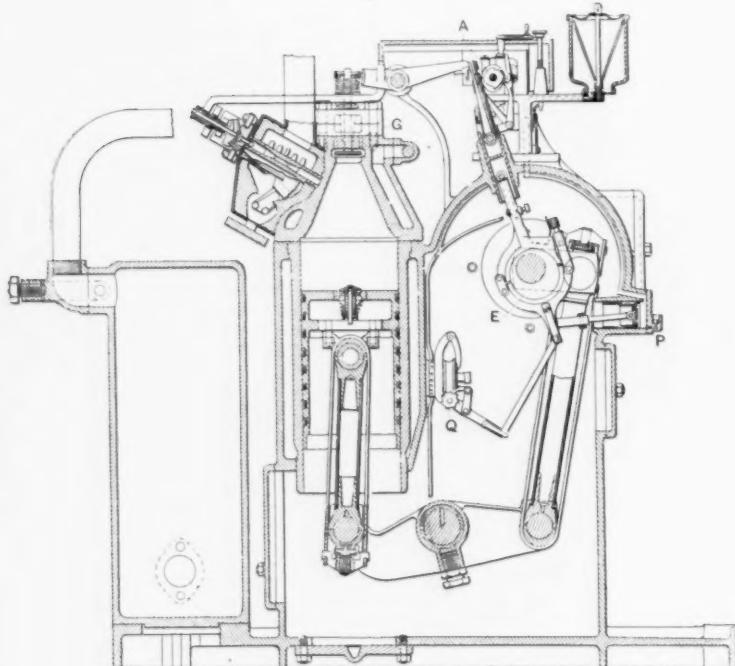


Fig. 1.

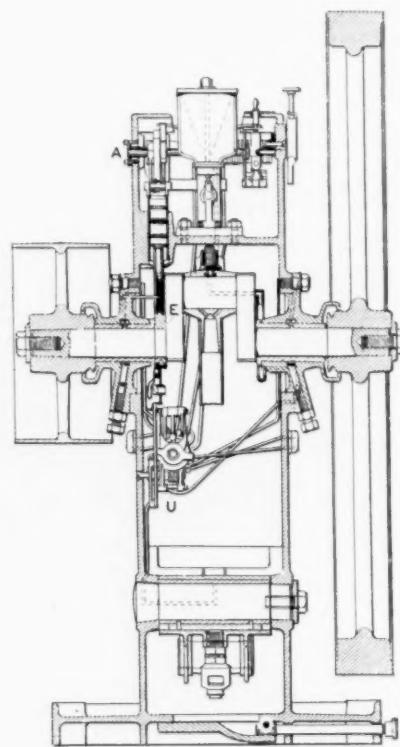


Fig. 2.

Vertical Sections through the Engine.

THE CAPITAINE PETROLEUM ENGINE.

construction has led to substitution of orifices in the cylinder for the admission valve, which are opened and closed by the travel of the piston; the oil is not fed in definite quantities by a pump, but is allowed to flow through a pipe, regulated by a throttling screw. The attempt has been made to substitute lubricators, by enclosing the engine completely and submerging the running parts. Revolutions have been increased to 500 and more to reduce the size and weight of the motor, and connecting rods have been shortened abnormally. Experience has taught that all these devices have caused trouble in oil engines. In engines now on the market the oil is either vaporized mechanically (Priestman), or it is evaporated and then mixed with air, in which (in case the walls are not kept at a temperature of 392 degrees F., which is disadvantageous because of the small amount of air doing work) the major part of the oil floats in the air as globules, just as in the previous case, only more finely divided. A greater or lesser part of this vaporized oil is precipitated on the surfaces of the cylinder, piston and combustion chamber during the compression period, in inverse proportion to the load. When the engine is loaded repeated combustion takes place and the internal surfaces have higher temperatures than when

effect may be obtained by inhaling a very rare and non-inflammable mixture, enriching it by oil just before the maximum compression, and thus making it ignitable. If it be remembered that oil engines are particularly suitable for small powers which require cheapness and utmost simplicity in operation and maintenance, it will be self evident that the limit of complexity necessary to obtain these advantages will soon be reached, and passing beyond it is tantamount to lower perfection. The following description relates to an oil engine which has been especially designed with the view of meeting the requirements for isolated small powers, in which the results of practical experience in regard to complexity of construction and simplicity—i. e., efficiency—have been used as a basis.

General Design.

The piston, as shown in Figs. 1 and 2, is not connected with the crank by the usual connecting rod; an intermediate rock shaft is introduced, requiring a special guide rod, increasing the centers of oscillation by three. Relatively large bearings and small bearing pressures, hardened and ground journals, easily adjustable boxes and careful automatic lubrication diminish the disadvantage of multiplications of pivots. Very important advantages are, however, obtained thereby. In

* From the *Zeitschrift des Vereins Deutscher Ingenieure*, translated by Gus C. Henning.

the first place, lateral thrust, exerted by the common construction of connecting rods, &c., on the cylinder walls and piston, is almost eliminated, and wear of these surfaces is reduced to a minimum, insuring stanchness of the piston, which is a very important point, especially in oil engines, because of the disagreeable odor of the gases. The engine frame also becomes smaller, and the vibrations become so much reduced that the engine runs smoothly and steadily at normal speed without requiring a masonry foundation or bolting it down.

Mixture of Vapor.

The shape and arrangement of the oil evaporator are essentially the same as in my earlier types. It is in constant communication with the interior of the combustion chamber, the required quantity of oil being inhaled through the small valve at *a*, Fig. 3, during the admission period, while a small quantity of air enters at *a* at the same time, vaporizing the oil and distributing it uniformly over the internal surfaces of the evaporator, which is heated externally. The mixture of oil and air issuing from the evaporator at *d* is forced downward into the cylinder by the air entering through the valve *G*. Thus far the mixing is done as in my earlier engines. In the latter the mixture is, however, imperfect, and especially in the smaller one and two horse-power engines considerable soot is deposited within the

Heating the Evaporator.

The heat required to evaporate the oil is relatively small. The general attempt to avoid the use of a heater is not due to the fear of the waste of oil consumed by the heating lamp, but rather to the uncertainty of the lamp, its danger and the bad odors generated by it. The use of a lamp has the great advantage of always keeping the engine in condition for instant operation. Intermittent service is a frequent condition for a small engine; it is started as required for the work and this starting by hand is not troublesome in engines of six or seven horse-power. In some engines there are automatic starters. They complicate the engine, however, make it more expensive and increase the chances of derangement. I have tried for many years to abolish the heating lamp and to construct a good engine without it. The problem seems very simple and easy, as it is only necessary to leave the combustion chamber partly or wholly unjacketed, or to provide a small chamber attached thereto which retains the heat while the former is cooled. Once heated, such uncooled surfaces will remain heated by the repeated combustion. But as small motors usually run under widely varying loads, frequently free, the transmission of heat, because of the very variable combustion, is likewise very variable. This produces disadvantages which it has been attempted to avoid in many ways, always, however, producing more

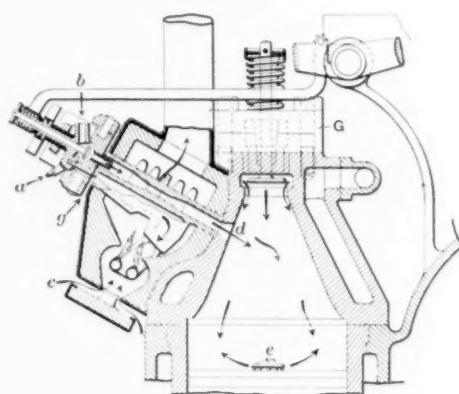


Fig. 3. Section through Oil Valve and Separator.

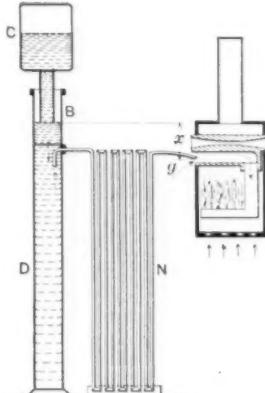


Fig. 4.

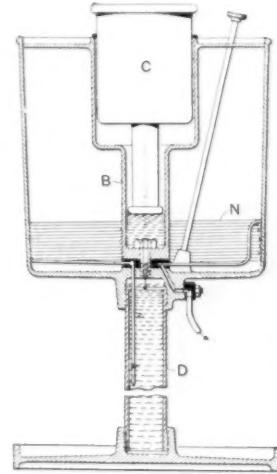


Fig. 5.

Sections through the Lamp.

THE CAPITAINE PETROLEUM ENGINE.

motor. To assist mixing another valve is provided in the base of the piston, which is operated like the valve *G*. The air, which enters in fine radial jets tangentially to the piston, through the valve *e*, Fig. 3, assists thorough mixing without thereby projecting the richer parts of the mixture against the cooled surfaces.

Ignition.

No definite explanation of the ignition and combustion has thus far been given for this engine. It may be assumed that the compression ignites the mixture by elevation of temperature when it is forced into the heated evaporator, for the temperature of the latter is usually so low that the mixture cannot ignite therein without compression. On the other hand, the compression alone, even when reaching 8 atmospheres, is not sufficient to cause ignition of the mixture so as to produce combustion at the proper time, when the engine is making 250 revolutions per minute. The composition of the mixture is of the greatest influence on the proper time of combustion. A compression of 8 atmospheres is unquestionably admissible in this engine without causing premature combustion; it is only necessary to properly choose the percentage of oil in mixture and the speed. Ignition has no doubt been produced even before compression has been half completed. However, ignition and combustion always require a definite period of time, which is shorter as the mixture becomes richer, and longer as the oil in the mixture diminishes. Hence the proper period of combustion in this machine is controlled solely by regulation of the quantity of oil fed. Difference of temperatures of the evaporator has but slight effect on the instant of ignition.

complex designs than by use of the lamp. The greatest fundamental difficulty with so-called automatic Exploders, without lamp or electricity, consists in the fact that they cannot be restarted after a protracted period of rest without renewed cumbersome reheating. I therefore attempted to avoid the disadvantages of a lamp, which are based on the uncertainty of operation and strong odor caused by obstructions of very small passages and orifices, and by the danger of fire caused by the fact that oil is fed under pressure and that it can leak in large quantities. In the lamp shown in Fig. 3 the fine oil orifices are avoided and interruptions totally avoided; the excessive flow of oil in quantity greater than that actually required is prevented, and finally, deposits of any kind cannot be formed, and it cannot be destroyed by heat. The principle of the lamp is more clearly shown in Fig. 4 than in Fig. 5, equal letters referring to equal parts. The oil runs from the inverted bottle *C* into the vessel *B* and from it by a small hole in its bottom into the reservoir *D*, where coarser impurities settle out. The oil passes from *D* by the long thin pipe *N*, 1-12 inch in diameter, which acts as a retarder. Friction of the oil in *N* destroys the hydraulic head *x*, and the same effect as by throttling at the orifice is secured, and hence accidental choking of the pipe is precluded by the relatively large diameter of tube. The oil passes through *N* drop by drop, entering at *y* into the open duct provided at the under side of the evaporator, evaporating and passing into the descending duct mixed with air, and escapes by the horizontal perforated tubes to ignite and burn. The air passing through the ducts with the oil vapor prevents caking, which is so prevalent in ordinary lamps. Raising or lowering the flask *C* regulates the amount of oil fed to the lamp at will.

Because this lamp is absolutely reliable it is allowed to burn night and day. The consumption of oil over night is so slight that the cost thereof as compared to the loss of time of reheating the lamp and evaporator is insignificant. The engine is always ready to be started.

OIL FEED.

One of the most important conditions for positive serviceability of the engine is the reliable and uniform feed of oil to the evaporator. A pump which feeds definite quantities of oil has the advantage of feeding equal quantities under all speeds of engine, which is not the case when the flow of oil is merely regulated by a throttling bolt. On the other hand, pumps heretofore used were defective, in that the plungers soon began to leak and caused irregular service. The oil pump shown in Figs. 6 and 7 is a diaphragm pump, having a circular valve for admission and emission. A is the shaft, which at the same time operates the outlet valve; it is driven by pawls and ratchets and an eccentric on the crank shaft. The end of this shaft carries a disk, O, with two pins, J, which operate the disk valve R, thus revolving the lat-

diaphragm are moved in such a manner that the lever W is inserted under the exhaust valve, one end of which at this moment is in its highest position, holding the exhaust valve open. At the same time the lever W₁ releases one of the pawls which serves to operate the valve spindle A, Fig. 1; the oil pump is arrested. If the speed decreases slightly the plate is not drawn toward the opening S, and the engine continues steadily at work. Adjustment of set screw K regulates the speed of the engine at will while running.

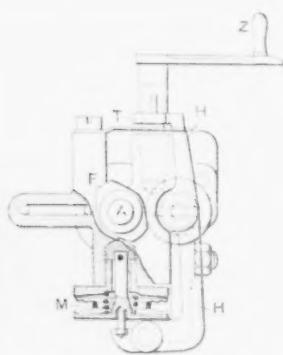


Fig. 6.

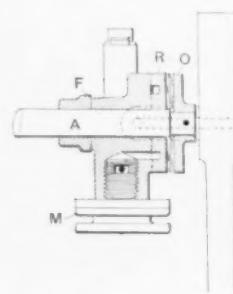


Fig. 7.

Sections through the Oil Pump.

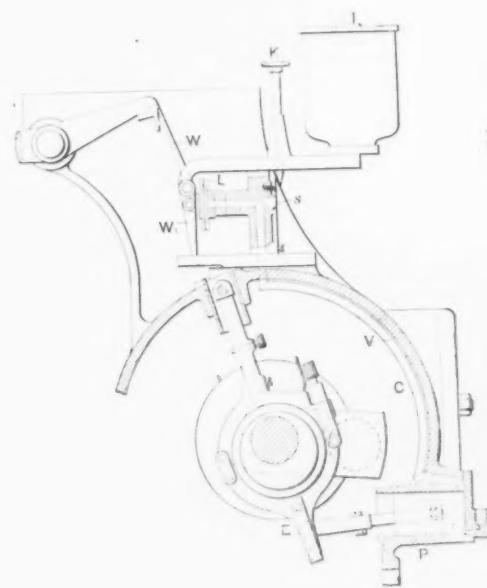


Fig. 8.—Section through Speed Regulator.



Fig. 9.

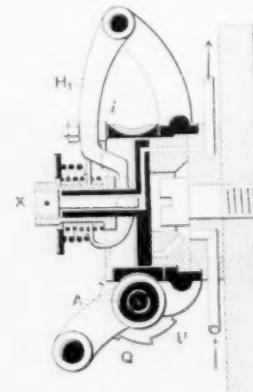


Fig. 10.

Sections through Lubricator.

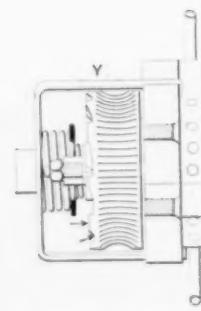


Fig. 11.

THE CAPITAINE PETROLEUM ENGINE.

ter. The shaft carries another disk, F, which is not round, which drives the lever H and operates the diaphragm M. The diaphragms consist of two corrugated tin disks soldered to two other solid disks. The stroke of H adjusts the delivery of the oil. This adjustment as well as complete arrest is secured by the eccentric sleeve T, controlled by the lever with handle Z, acting against the extension of lever H.

SPEED REGULATION.

A small air pump, P, Fig. 8, operated by eccentric E, inhales air through orifices S, in front of which, at a very small distance, a thin movable plate is fixed. The position of this plate is adjusted by the set screw K. If a certain speed be exceeded this plate is drawn toward the opening by the increased suction of the pump at the instant of its maximum piston speed, and closing S produces rarefaction in the pump cylinder in duct V and the connecting ducts, and the closed diaphragm L will collapse. The levers W and W₁, connected to the

LUBRICATION.

The lubricant is delivered to the different parts of the engine in proper quantities by pressure. Thus it is forced between the piston, its rings and the cylinder under a pressure of several atmospheres. The lubricator is shown in Figs. 9 to 11. The ratchet wheel Q having a worm, U, is rotated by eccentric E, Fig. 1, by means of a pawl. This causes the ring Y, having a thread on its circumference geared with U, to rotate as well, and operates the disk valve. A small piston, X, moving easily in a bored hole in the disk, is forced against the valve surface by a spiral spring, but forced away from it by the lever H₁. The lever H₁ is pressed by a spiral spring against the ring Y, and is raised by the rising surface, thus forcing the piston outwardly and causing it to draw oil through the openings in the disk valve. As shown in Fig. 11, the lever H₁ drops suddenly with the piston from its highest position, thus forcing the oil through an orifice adjoining the suction

opening with considerable excess of pressure (depending upon the force of the spring) to the wearing surfaces. Rapid motion of the piston avoids all necessity of any packing.

Connecting Rods.

The bearings for the connecting rods and the crank shaft are bound together by a properly designed adjustable tension strap. A nutlock secured by a spring cushioned pawl prevents the adjusting screw of the tension strap from becoming loose, and at the same time holds the screw firmly in place, and the adjustment is made automatic, even in the hands of a novice. The number of revolutions may be said to be about the average; it is 300 for one horse-power, 280 for two horse-power, 260 for four horse-power and 240 for six horse-power.

This description will show the general dimensions of the engine to be small when compared with the number

The Farquhar Pulley Molding Machine.

The accompanying engravings show the pulley molding machine which is being introduced by the J. W. Paxson Company of Philadelphia. It is designed particularly for the molding of flat faced pulleys, but crown faced pulleys may also be molded with it. In construction the machine is simple. It consists of two hollow cylinders, one rising within the other and forming the pattern for the pulley rim or face. Within the top of the inner or rim cylinder the pattern of the spider is supported. The rim cylinder is raised and lowered by means of a shaft connected with it and operated by a hand wheel and a system of gearing. Two racks on the outer cylinders receive the gearing, and a vertical slot in the cylinder allows of the upward and downward movements of the shaft. Locking is done by a brake. A flange on top of the machine receives an iron flask, which is secured to the machine by means of two dowel pins, one in the flask and the other in the machine.

Fig. 1 shows the machine uncovered, with the spider pattern on top. Fig. 2 shows the machine with the rim cylinder raised to form the face of a pulley. Fig. 3 shows the machine in a pit in a foundry, ready for use. The pit is boarded in, the top of the machine being level with the foundry floor. Access to the hand wheel is provided by an opening in the boarding. One-half of a pulley is made in a cope, the other in a drag. After the sand has been placed in the flask and rammed up the pattern is drawn by a turn of the wheel and the mold taken away. The old process of rapping is thus entirely done away with. The resulting pulleys are very uniform in weight and thickness of metal and evenly balanced.

Crown faced pulleys are made by the use of a collar, of the thickness required, around the rim. The machine is made in seven sizes, each having a capacity for pulleys of several sizes. Each machine is provided with a full set of iron patterns for three sizes of pulleys, covering arms, rims and hubs, made from the buyer's drawings.

The Chicago House Wrecking Company, West Thirty-fifth and Iron streets, Chicago, are in a position to save many people many dollars in these days of rapidly advancing prices. They have accumulated large stocks of a great variety of materials for use in building or equipping fac-

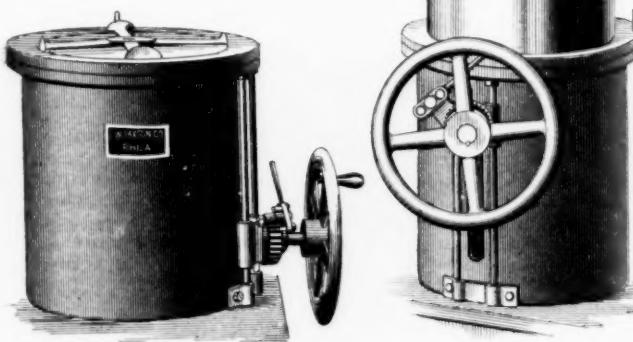


Fig. 1.—Machine Uncovered—Spider Pattern on Top.

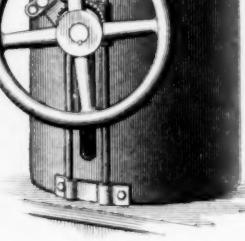


Fig. 2.—Rim Cylinder Raised to Form Rim.

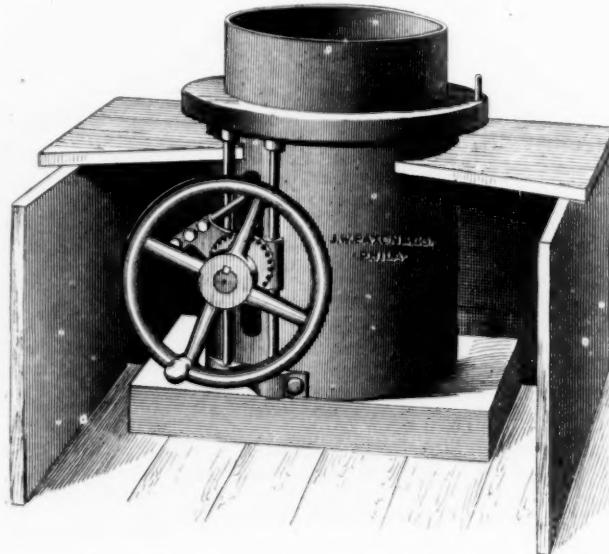


Fig. 3.—Machine in a Pit Ready for Use.



Fig. 4.—Machine with Rim Raised and Hoist in Position for Handling Flasks and Molds.

THE FARQUHAR PULLEY MOLDING MACHINE.

of revolutions. The engine does not require a separate foundation; the piston has a minimum of lateral thrust in spite of the small dimensions of the engine; the engine is always ready for service because of simplicity and absolute safety of the lamp; the necessity of cleaning the engine is almost entirely eliminated by the peculiar method of mixing vapors; interruptions caused by leaky lamps are avoided, and lubrication of all parts is automatic. Manipulation of this engine is much simplified.

It is constructed entirely by special tools, which were described in *The Iron Age*. All work is so accurately done that all parts, bearings, &c., are interchangeable throughout. This was attainable alone by use of special tools for every part of the engine, as described in the above article. The engine is built at the works of Fritz Scheibler, at Aix-la-Chapelle.

tories as well as miscellaneous merchandise of almost every description known to trade. They have issued their eighty-sixth catalogue, which buyers will find convenient and perhaps valuable. They have also begun to issue bulletins of special lots of merchandise and machinery which are sent regularly to buyers who furnish their addresses.

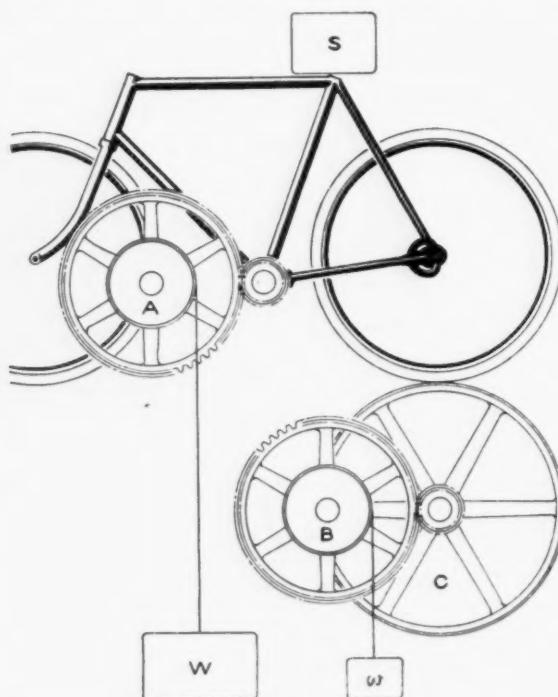
The partnership formed March 1, 1894, for the term of five years, between Edgar T. Ward, George Nash and John Ward, trading as Ward & Nash, is dissolved. On January 17, 1899, Edgar T. Ward and John Ward sold to George Nash all their interest in the store, stock and business carried on by Ward & Nash at 35-37 South Canal street, Chicago, Ill., and have purchased all George Nash's interest in the store, stock and business carried on at 23-25 Purchase street, Boston, Mass. A new firm are constituted,

consisting of Edgar T. Ward and his sons, John Ward and Edgar Ward, who will continue the business in Boston under the style of Edgar T. Ward & Sons. The firm are importers and dealers in bar, sheet and strip steel and steel wire and cold rolled steel. They handle Seelbohm & Dieckstahl's Dannemora tool and self hardening steel.

Dynamometer for Testing Bicycle Tires.

Most of the larger establishments engaged in the manufacture of bicycles have for the last year or two devoted considerable attention to the measurement of the resistance, due to friction of various kinds, which the bicycle offers to propulsion. This kind of investigation was greatly stimulated by the controversy concerning the efficiency of chainless wheels, and to-day the dynamometer is a part of the equipment of many of the leading concerns.

Almost the first result of scientific study of the resistance of a bicycle was the revelation of the supreme importance of the tire. Racing men and some manufacturers had indeed known for years that there was much difference between a "fast" tire and one which was not "fast." Yet few realized how great a part of the total



DYNAMOMETER FOR TESTING BICYCLE TIRES.

resistance was that due to the constant flexure of the materials of the pneumatic tire.

One well known and distinguished professor conducted an elaborate series of tests and published some surprising statements before discovering that the difference in tire resistances, due to variations in construction and in degree of inflation, were so great as to render quite worthless his conclusions as to the relative merits of different forms of driving mechanism. Of course any good dynamometer may be used for testing tires. Coasting tests, also, are of value, though their apparent results are often vitiated by the skill or the clumsiness of riders.

The Pope Mfg. Company do most of their bicycle testing by means of a Webb float dynamometer, an instrument carefully described by Prof. J. E. Denton in an article published in *The Iron Age* for October 21, 1897. Desiring, however, some dynamometer which could be used for testing tires more rapidly than the more elaborate instrument, the Pope Company designed and have for some time had in use a novel dynamometer specially adapted to this work.

In principle it is simply a large Atwood machine. A weight, which in practice varies from 225 to 350 pounds, suspended by piano wire, descends about 60 feet, unwinding from a drum like a clock weight. The motion of the drum is communicated by a spur gear to the crank shaft of a bicycle. The bicycle has a prescribed load on the saddle and its rear wheel rests on the rim of a light pulley called the track pulley, which it rotates. This pulley in turn, by a spur gear and drum, winds up a weight of from 50 to 150 pounds, as may be found desirable.

The accompanying drawing gives a clear idea of the working parts, though no attempt has been made to indi-

cate, except in a general way, the relative sizes of the toothed wheels and the drums. A is the driving drum, W the driving weight, B the driven drum, w the weight that is raised by the bicycle, C the track pulley, S the saddle load.

In order to steady the mechanism and to secure substantially uniform velocity as soon as possible after starting, fans were inserted between the spokes of the track pulley. The parts are so proportioned that the bicycle, if of 70 gear or higher, may be allowed to run 1 mile. The operator simply notes, with a stop watch, the time required for this run.

The dynamometer has given great satisfaction in comparative work. It "checks itself" admirably and seems never to get out of order. All the shafts run on ball bearings, and the work done by the bearings of the bicycle itself is so slight, owing to the small load wound up, that the resistance overcome is little except that of the tire and that of the fans. Its sensitiveness is very great, the times for the run of a mile with different tires recently tested having varied from 2 minutes 23 seconds to 21 minutes 29 seconds.

As showing the reliability of the instrument, the records of the performance of a single standard tire, given a run every morning for a week, may be of interest. They were as follows: 2 minutes 12 seconds, 2 minutes 12 seconds, 2 minutes 13 seconds, 2 minutes 12 seconds, 2 minutes 14 seconds, 2 minutes 12 seconds. Twelve days afterward, the work having been meanwhile discontinued, the standard tire was tried again and ran its mile in 2 minutes 14 seconds.

The McCormick Harvesting Machine Company.—The McCormick Harvesting Machine Company, Chicago, are arranging to make important extensions to their great plant. They will erect a malleable iron foundry, a factory for the manufacture of knives or cutter bars, a large twine mill and possibly some other shops for the production of specialties required in their business. They have been large purchasers of these in the open market, but believe that the time has come when it is advisable to make as much as possible of what they require. It is stated that the improvements thus contemplated will involve the expenditure of about \$1,000,000. Their force of employees, which is now about 4000, will then be practically doubled.

An English newspaper says: "Considerable quantities of American tin plate bars have lately been delivered in South Staffordshire and in South Wales, both for the sheet and the tin plate industries. The bars have not always been bought because they were cheaper than English. As a matter of fact, they have been bought both cheaper and dearer than British bars of even date, but they are rather softer than English steel, and are to some extent preferred by the workmen. Then again, they are of a more convenient size, being 10 inches wide, instead of 7 inches, as in the case of English bars. It would probably be worth the while of British manufacturers of tin plate bars to consider whether a wider bar would not be more generally approved by their customers. The American bars have to pay 8 shillings freight to New York, and usually 15 shillings freight across the Atlantic, with 8 to 12 shillings freight from British ports to the Midland manufacturing centers, so that there is 31 to 33 shillings transportation charges upon them before they reach the consumers."

We are advised by W. H. Schoen of the Pressed Steel Company, at Pittsburgh, that the statement that they would erect a bridge across the Ohio River, connecting their works in Lower Allegheny with the new plant at McKee's Rocks, Pa., almost directly opposite, is untrue. Such a scheme may come up later, but at the present time nothing has been done regarding it.

The recent purchase of 28,000 tons of 85-pound steel rails by the Baltimore & Ohio Railroad, brings the total amount of rails bought since March 1, 1896, up to 115,300 tons, enough to relay 870 miles of track. Of the new rails ordered 8000 tons are to be laid on the lines west of the Ohio River, and 20,000 tons are to be used as follows: Forty-four miles on the Philadelphia division, 11 miles on the Second division, 13 miles on the Third division, 30 miles on the Fourth division, 10 miles on the Connellsburg division and 21 miles on the Pittsburgh division. The Southwestern division, between Parkersburg and St. Louis, will have 40,000 tons of rails to lay this spring.

There has been introduced into the Legislature of West Virginia a bill prohibiting, under a heavy penalty, natural gas companies from forcing gas through their mains by mechanical power. It is claimed that the supply of natural gas is being rapidly exhausted by this means. The natural gas companies of the State are preparing to prevent the passage of the bill.

Defects in Threads on Wrought Iron Pipe.

The following article was written by R. T. Crane, president of the Crane Company of Chicago:

Undoubtedly you will be surprised when we say that no material of equal importance and of such universal use by men of general intelligence is so absolutely misunderstood as this. The amount of labor and material thrown away under a misapprehension of this question is enormous. It seems astonishing that at this late day there should be so much stupidity in this business. We have recently been studying and experimenting on this subject, and might say that we are astonished at our own stupidity up to this time in regard to it.

Flat Threads.

The general run of steam fitters will discard material on account of the threads being a trifle flat. If one will only stop to reason out this matter he will see how absurd this idea is. The entire thread on the pipe must be flat, in order to conceive of a leak being produced, and then the leak must traverse the circumference of the pipe as many times as there are threads in contact.

Now, it might be possible to have a leak under these circumstances if no cement were used; but with the use of any cement, or without cement, but with the smallest particle of perfect thread, this could not occur.

Small Grooves.

With regard to the small grooves that sometimes occur in threads, due to the weld not being perfectly brought up, this is another feature on account of which an immense amount of threading is rejected. It will be seen, upon a little reflection, that this groove could not possibly produce a leak unless it ran the entire length of the thread contact, and in depth went below the bottom of the thread.

Broken Threads.

Another cause of rejection of material is where the threads have been broken off a little. Probably not so much as 1 per cent. of the whole bearing of the thread is gone, yet the wise (?) steam fitter will throw out this material. This is also an absurd theory, there being a large factor of strength in the length of all threads, as we know from tests that we made some time ago with an 8-inch coupling. We cut away all the thread excepting $\frac{1}{8}$ inch, thereby leaving only about one-fifth of the ordinary bearing of that size thread, after which it was put under a pressure of 1000 pounds without a leak.

It is no doubt the common practice of steam fitters and engineers to reject threads where only 1 per cent. are broken. The utter absurdity of this is shown by the above test, wherein about 80 per cent. of the strength of the thread had been taken away.

For the purpose of illustrating these erroneous ideas, we took an 8-inch coupling and a piece of 8-inch pipe, and throughout the whole length of the bearing of the thread in the coupling and on the pipe we made grooves such as are likely to occur when there is a defective weld. The grooves extended about half the depth of the thread, and were made 1 inch apart for the entire circumference of the pipe. Then we flattened all the threads, both on the pipe and in the coupling, excepting a mere speck in each. Also, to offset the broken thread feature of this question, we cut three grooves in the pipe, $\frac{1}{4}$ inch wide and the full depth of the thread.

This coupling and piece of pipe were then screwed together and tested to 500 pounds of air, at which pressure the joint was tight, demonstrating conclusively the stupidity of steam fitters on this subject, as claimed in the beginning of this article. The amount of defect in the threads used in this test was at least 100 per cent. greater than that for which the regular steam fitter or engineer will reject material.

The report of the Special Master in Chancery who has been taking testimony at Denver, Col., in the cases brought by the Colorado Fuel & Iron Company against the Southern Pacific, the Denver & Rio Grande, the Rio Grande Western and other railroads operating between Colorado points and San Francisco, Cal., for damages on account of excessive freight charges which was filed on Saturday, upholds the company's claim for damages in the sum of \$100,000. Exceptions to the report have been filed by the defendant companies.

Advices from England intimate that Mr. Parson's new "Turbinia" will be ready for trial within two months. The new vessel is 220 feet long and of 330 tons, or more than double the size of the initial boat, and she embodies a number of modifications in the machinery with new arrangements for obtaining greater speed in going astern. She will have eight propellers on four cranks, instead of nine propellers on three cranks, as in the first "Turbinia."

THE WEEK.

Advices from Anderson, Ind., assert that the attempt to combine the natural gas plants supplying Indiana, Ohio and Illinois cities with fuel from the Indiana field has fallen through. Seventeen companies, having 176,300 acres of the best gas territory in Indiana under lease, and 930 good wells, were to have been consolidated with a capitalization of \$60,000,000. The trouble is said to have arisen over the distribution of the preferred stock.

The Minnesota House of Representatives have rejected a bill providing a bounty for pig iron produced in Minnesota.

Great damage was done to the Florida orange groves by the freeze last week. Snow covered all of the State as far south as Tampa on the west coast and St. Augustine on the east. The orange trees were in bloom and the blossoms were killed by the frost. It is believed that the prospects for a crop next fall are destroyed in a large portion of the orange belt.

Extensive frauds have been discovered in the water distribution of Havana, fully one-fifth of the householders have been stealing their supply from the city in connivance with the officials.

Emile Loubet, President of the French Senate, was on Saturday elected as President of France in the place of the late Felix Faure, who died suddenly of apoplexy on Thursday last. M. Loubet, who is 60 years of age, and of unblemished character, has the reputation of being an excellent man of affairs and a capable lawyer. He is looked upon as a safe rather than a brilliant executive.

For the seven months of the current fiscal year ended January 31, the foreign trade of Canada shows an increase, compared with the corresponding period of last year, of \$11,500,000. The increase, however, is due entirely to augmentation of imports, for the exports from the Dominion decreased \$4,703,000 in the period named. An interesting feature of the Canadian trade returns is that five months' operations of the new Canadian tariff, which gives merchandise from England and her colonies lower rates than that from the United States, have not reduced our sales to the Dominion. As a matter of fact, the exports from the United States to Canada have been, during the past five months, nearly 20 per cent. greater than in the corresponding months of the preceding year, while those from the United Kingdom and the British colonies increased less than 10 per cent. in the same period.

The London *Times* says that Sir Claude MacDonald, British Minister at Pekin, China, has obtained a concession for a British syndicate to construct a railway from Hankow to Canton along the coast.

Henry G. Morse, formerly president of the Harlan & Hollingsworth Company of Wilmington, Del., is reported to be promoting a scheme for the establishment of a large shipbuilding yard, to be located, most probably, at Baltimore, Md. Mr. Morse is said to have secured the support of several of the most prominent financiers and business men of the Monumental City, and it is believed local capital to the amount of about \$3,000,000 can be obtained for the furtherance of the plan.

Philip D. Armour has given a further sum of \$750,000 to the endowment fund of the Armour Institute of Chicago, making his total gift to the Institute \$2,250,000.

President Orcutt of the Newport News Shipbuilding & Dry Dock Company, Newport News, Va., announces that the company have signed a contract for the building of two 12,000-ton steamships for the Pacific Mail Company. These vessels will be the largest merchant steamers ever built at American yards. Their contract price is said to be \$3,500,000.

According to Superintendent Collins of the New York State Prison Department, satisfactory progress has been made in the development of the new industries in the State prisons, which were established on January 1, 1897, as required by the new State Constitution. Superintendent Collins says that the present system of employing the convicts promises to be effective. Sixteen industries have been established, which give employment to 1564 men. The number of men employed in each industry is: Clothing, 247; shoe, 87; brush and mattress, 93; printing and stationery, 14; miscellaneous, 192; cloth, 248; cabinet, 123; iron casting and school furniture, 139; broom and basket, 31; bed and brass, 46; shirt, 71; hosiery and underwear, 103; tinware, 33; laundry, 7; wood work and basket, 26; weaving (cotton cloth, &c.), 94. At the end of the year only 303 prisoners were idle, but these would shortly be put to employment. The industry during the past year shipped to

the State and its institutions supplies amounting in value to \$494,720. In addition there was accumulated a stock in some staple lines sufficient to insure prompt shipment of articles required.

Another big industrial combine was incorporated last week in the General Chemical Company, who took out a charter under the laws of New York State. The company's authorized capital is \$25,000,000, one-half of which is 6 per cent. preferred stock. The principal office is in Phillipstown, Putnam County, N. Y., and the object of the concern is "to manufacture and deal in chemicals and other products in this and foreign countries."

The Bath Iron Works, Bath, Me., have some \$2,250,000 worth of shipbuilding work on their books, and are looking forward in consequence to a lively summer's work. The company are about to increase the number of workmen to 1200.

The Santiago Copper Company, Limited, of New York City, have been incorporated in West Virginia for the purpose of locating and operating mines in the United States and Cuba.

The Pennsylvania Electric Vehicle Company have been incorporated with a capital of \$6,000,000 under the laws of New Jersey, to make and deal in self propelled vehicles. The incorporators are Cornelius W. Woodward and William J. Jackson of Philadelphia, and Josiah P. Dubois of Camden, N. J.

J. A. Acklen of Los Angeles, Cal., has been granted by the Canadian Government the privilege of maintaining a waterworks system at Dawson City. To secure the supply of water the Klondike River is to be tapped four miles above Dawson.

Arrangements are being made to transfer many of the exhibits, and especially those of the South American countries, in the Paris Exposition of 1900 to the Pan-American Exposition of 1901, to be held in Buffalo.

A syndicate of New York and Philadelphia capitalists has purchased the entire street railway system of the city of Buffalo, N. Y., and five important suburban lines, the transaction involving an expenditure of \$25,000,000.

The alleged discovery of deposits of gold and copper near Pryor Creek, I. T., has caused a big influx into that district of prospectors and miners from the surrounding country.

The Japanese Government is arranging for the first international exposition in that country. It will probably be held in 1902 and efforts will be made to attract exhibits from all countries.

The Richmond Locomotive & Machine Works, Richmond, Va., have received a cable order from Sweden for 20 compound locomotives.

The Calumet & Hecla Mining Company have declared a dividend of \$10 per share and an extra dividend of \$30 per share.

The naval powder magazine at La Goubran, between La Seyne and Toulon, in Southern France, exploded early in the morning of last Sunday. Disastrous results from the explosion were felt within a radius of 2 miles, the country adjoining being swept almost bare. A large number of persons were killed and injured. According to the cabled report it is believed the explosion originated "in chemical decomposition of smokeless powder."

An effort is being made by American capitalists to acquire control of the Cuban tobacco trade. The Havana Commercial Company, now being organized in New York, with a capital stock of \$20,000,000, propose to acquire the cigar factories and tobacco lands of a number of leading concerns in and near Havana. These factories have a yearly capacity of over 100,000,000 cigars.

The Fifty-fifth Congress, which closed its life on Saturday last, made appropriations aggregating \$1,566,890,000. Of this vast sum \$482,562,000 was appropriated to meet the expenses attending the Spanish war.

According to lumbermen in the East there never has been such a dearth of lumber within recollection. The demand is good and increasing, but the low stocks are inadequate to satisfy the demand, particularly in hard woods. Prices of lumber are advancing sharply. The Government's order for 25,000,000 feet of pine for use in the erection of barracks, &c., for the troops in Cuba and Porto Rico has nearly cleared the market of that wood. The scarcity is likely to be serious in view of the near approach of spring and the large amount of building in contemplation.

Two royal mechanical students, both nephews of the King of Siam, are now undergoing a practical training in English works. One, Prince Sesser, is learning locomotive building at the Gateshead works of the North-Eastern

Railway Company, and the other, Prince Bavaradiez, has become a pupil at the Elswick Engineering & Ordnance Works.

The discovery of large petroleum fields in the province of Cautin, Chili, is reported.

The month of February, 1899, showed the heaviest monthly aggregate of fire losses, according to the New York *Journal of Commerce*, that has been recorded in many years. The losses in the United States and Canada reached the abnormal total of \$18,469,000, as compared with \$10,718,000 in the preceding month and \$12,629,300 in February, 1898, which was taken to be a month of unusually heavy losses. The loss in February, 1897, was only \$8,676,000. There were no less than 279 fires last month of a greater destructiveness than \$10,000 each, while 18 large conflagrations, each involving a loss of \$250,000 and over, materially swelled the total of losses.

President Henry Peartree of the American Chamber of Commerce in Paris has addressed a circular letter to corporations and certain individual business men in the United States asking their co-operation with a view of establishing better commercial relations between this country and France. The letter urges the desirability of a treaty of commerce between the two nations, which, it is claimed, would be an important factor in the expansion of American commerce and the diffusion of American products in France. The power conferred upon the President by the Dingley law to conclude a reciprocal treaty expires on July 24 of this year, and the need of prompt action in the matter is therefore urged.

An important consolidation concluded this week is that incorporated by New Jersey under the title of the American Brick Company, with a capital stock of \$10,000,000. The new concern is authorized to deal in brick, stone and building materials of all kinds. The promoters are New York capitalists.

In regard to the projected consolidation of lake ship building interests, the Cleveland *Plain Dealer* of March 7 published the following semi official announcement: "The new combination of the shipbuilding and kindred interests on the lakes is in a very fair way to being carried through to completion. The stockholders of the local concerns which are to become part of the new company have all had their meetings and have almost unanimously voted to transfer their property. The name of the new company will be the American Shipbuilding Company. The capital will be \$30,000,000, divided into \$15,000,000 7 per cent. preferred and \$15,000,000 of common stock. The Cleveland concerns to go into the combination are the Globe Iron Works Company, the Cleveland Shipbuilding Company and the Vessel Owners' Dry Dock Company."

Tenders were received on Monday for the Quebec bridge, to which the Canadian Parliament is expected to give \$1,000,000. There are four tenderers: The Carnegie Steel Company of Pittsburgh, the Dominion Bridge Company, Montreal; the Phoenix Bridge Company, Pennsylvania, and the Union Bridge Company, New York. The tenderers submitted plans for both cantilever and suspension bridges. It was decided to appoint a committee of experts to decide which shape the bridge should take before proceeding to award the contract.

Both branches of the Montana Legislature have passed over Governor Smith's veto the bill empowering the owners of two thirds of the stock of a corporation to compel the holders of the rest of the stock to sell out at an appraised valuation, or accept stock in another corporation for their holdings. This bill will enable Montana copper companies to go into a combine, if the owners of two-thirds of the stock so wish.

The French customs returns for the year 1898 show total imports of merchandise amounting to \$875,239,000, an increase of \$84,033,600 over those of 1897, caused principally by the importation of large quantities of wheat. The exports during 1898 amounted to \$700,633,400, or \$18,957,000 less than in the preceding year. The falling off was general throughout the whole list of exported products.

It is officially denied that the Carnegie Steel Company, Limited, are negotiating for the purchase of the Queen mine of the Lake Superior Iron Company in the Marquette range in Michigan.

The Treasury Department has instructed the Board of United States General Appraisers that natural gas imported under the provisions of the Tariff act is entitled to free entry as a crude mineral in accordance with a recent decision of the Supreme Court of the United States. The matter has been an unsettled question for a long time and has caused considerable litigation. The Collector of Customs at Buffalo has been directed to discontinue the practice of assessing duty at the rate of 10 per cent. ad valorem on the importations of natural gas from the Canadian field.

The Iron Age.

New York, Thursday, March 9, 1899.

DAVID WILLIAMS COMPANY,	- - - - -	PUBLISHERS,
CHARLES KIRCHHOFF,	- - - - -	EDITOR,
GEO. W. COPE,	- - - - -	ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS,	- - - - -	HARDWARE EDITOR.
JOHN S. KING,	- - - - -	BUSINESS MANAGER.

Excessive Taxation of Productive Industries.

The equitable imposition of taxes involves many perplexing questions. Every citizen recognizes in the abstract the necessity of bearing his share of the burdens of society and civilization, but in compliance with the natural propensity to take good care of his own interests he prefers in practice that other people should carry the burden of taxation. Our solons recognize this fact and seek to strengthen themselves with the masses by devising schemes of taxation which will to a considerable extent relieve the great body of the people from making involuntary contributions of this character for the general welfare. Thus we see in some States the levying of special taxes on corporations to the end that private holdings of real estate may be exempt from the necessity of financially supporting any part of the State machinery. The law makers would, of course, be pleased to secure enough revenue from such a source to avoid the taxation of private property for local purposes, but everything has its limitations. Efforts are constantly being made in other States to shift the burden of taxation to other shoulders than those of the individual citizen, and the railroads have quite frequently been regarded with much favor as possible bearers of greater burdens. A disposition is now being shown in some of the Western States which have become conspicuous as producers of minerals to make the mining companies pay quite heavily for their rights and privileges. Rates have been proposed in this connection by revenue reformers which on the current output would bring enormous sums into the State treasury, sufficient alone to release individual citizens from paying any taxes for State purposes.

Legislation of this character is wrong from every standpoint, and therefore entirely indefensible. If the people of any State in the Union were being oppressed by excessive taxation they would be justified in seeking measures of relief and in endeavoring to find sources of income better able to contribute. But in no civilized country do the masses of the people pay so little for governmental purposes as in the United States, the only groaning over excessive taxation coming from either those who would avoid all taxes or those who are in that way currying favor politically. When the taxes levied on our citizens are compared with those borne by the people of other nations, and borne also without serious symptoms of unrest or dissatisfaction with their Governments, a feeling of contempt naturally arises for the small souls who would endeavor to shirk all civic burdens or climb into political prominence by catering to such pettiness. Every man and all species of property should be taxed as equitably as possible. No exemptions should be made. Nothing taxable should escape through an excess of taxation imposed on something else.

Excessive taxation on productive industries, such as mining enterprises, is particularly indefensible. Mining is a precarious business, even under the most

favorable circumstances. It is true that some mining companies have made enormous profits, and are paying large dividends to their stockholders. But of how many can this be said? Most mining companies require the closest care and the shrewdest management to earn dividends for their stockholders. The few making large dividends are always most prominent in the public eye for that reason, while the others receive little attention and their small dividends or lack of dividends only interests their stockholders. It would be unjust in the extreme to put the same tax per ton on the output of all companies mining the same mineral, when such differences prevail in their profits. What might be considered a light tax would in times of slack business probably cause a number of mines to be closed down and the workmen to be thrown out of employment. Mining companies generally had troubles enough from 1893 to 1898 in endeavoring to make both ends meet, but if they had in addition been obliged to pay a stiff tax to the State on every ton of output they would have been in much more serious shape and would have been compelled to offer still lower wages to their workmen. It is of great importance to any State to have its mineral wealth opened up by enterprising men. Additional communities are established and perhaps other centers of great industrial activity are created, which augment the importance of the State commercially and politically. Capital should not be discouraged by excessive taxation from making such ventures.

A Duty of the Great Consolidations.

If our iron and steel consolidations expect to differentiate themselves from the somewhat discredited group of "industrials" they will do well to imitate the attitude of our great railroad systems to the general investing public. Blind pools have been successful, but only in exceptional cases, while the vast majority of corporations which seek for their stockholders the advantages of an ever ready market in their securities have made concessions to the public by giving out at frequent intervals official statements of gross and net earnings. The great consolidations in the iron trade have much prejudice to overcome. Their securities are not accepted at all as collateral by some banks, while they are taken only sparingly by others. The conservative element among investors is pointing with warning to the large nominal capital of these corporations, not having any conception of their earning capacity. We take it that the managers of the new corporations in the iron trade desire not alone to secure for their concerns good credit in financial circles, but propose also to develop as good and safe a market for the securities as possible. The majority, it is true, now have close relations with groups of large financial interests. Others possess large reserve funds for working capital and for future improvements. It may not appear to such a pressing matter to secure the somewhat shadowy good will of the financial and investing community. But the day may come when the support of financing syndicates is withdrawn, and at all times the interests of the stockholders ought to be considered. In the long run an interest in a mystery is not salable at as good a figure as is a holding in a concern which commands confidence because some definite knowledge concerning its earning capacity is available. In some cases semi-official estimates are given out in a roundabout way. That is good enough so far as it goes, but it does not go far enough.

The charters of some of our new corporations are so drawn that the powers of boards of directors are closely narrowed down, the avowed purpose being to retain for the stockholders the final control of the property. We imagine that in the case of these companies there will be little opposition to a course in harmony with the whole spirit of the undertakings. There may be more doubt in the case of those concerns in which almost absolute discretion has been vested in the boards of directors. Such companies should even be more willing and eager to conform to the practice of well conducted public enterprises by publishing statements of earnings at regular and frequent intervals. Those of them which are on a sound basis could make no wiser move than to emphasize the difference between them and the rickety consolidations who are not likely to outlive the present boom times.

We doubt whether there is more satisfactory reading to those interested in the iron trade than that of the frequent announcements of advances in wages. That the policy of giving the men prompt participation in the benefits of advancing markets is so general is indeed a proof of the wisdom of producers. It shows that they take a broad and liberal view of the situation, and that they are determined to take every step to avoid any disturbances which might interfere with the paramount duty of taking care of consumers' requirements.

CORRESPONDENCE.

SILICON IN ANNEALING MALLEABLE CAST IRON.

To the Editor: I have read with much interest the article on "Malleable Cast Iron" by Eras. C. Wheeler in the recent issues of *The Iron Age*. There is one statement which seems to be at variance with the commonly accepted belief. On page 3, February 16, the author says: "There should be a loss of at least 40 per cent. silicon from the original mixture to the finished material. Some will be lost in melting and the balance during annealing. Silicon and carbon, working in certain ratios with each other, will not be effectually eliminated by the weak decarbonization of a slow and cold working furnace." On page 5, February 23, four analyses are given which, if I correctly interpret them, show a loss of about one-third of the silicon during the annealing.

G. P. Royston (Jour. B. I. & S. I., 1897 vol. p. 160) says: "As the carbon is the only material which is capable of being removed during the annealing the proportion of other elements present in the iron are not here recorded. On page 157 this author gives analyses of a test piece before and after annealing. There is no difference shown in the silicon except that due to experimental error, in this case 0.005 per cent. in a sample containing 0.57 per cent. silicon.

H. R. Stanford (Amer. Soc. Civil Eng., vol. XXXIV., pamphlet No. 754) gives over 30 analyses of test pieces before and after annealing. Except in one case the greatest difference shown is 0.03 per cent., which is within the limits of experimental error when we consider the slight irregularities that are liable to occur in the distribution of metalloids in a casting. Also that there is theoretically an increase in the percentage of the remaining metalloids due to loss of carbon. That is to say, the casting loses weight during the annealing, and if the amount of silicon remains constant it would represent an increased percentage in the annealed casting. In test 282 there is an apparent loss of 0.08 per cent. silicon, but Mr. Stanford notes that "this bar was poured from first ladle drawn from heat." Other bars from different parts of the same heat showed the normal result.

J. E. Stead (Proceeding Cleveland Ins. of Eng., December 16, 1895) has shown that on the exterior of malleable castings the silicon may be oxidized, but remains in the iron, and Mr. Royston confirms this statement. This occurs in castings that have been over annealed, but as the reaction is limited to a very thin scale, which would in castings of ordinary size represent only a very small proportion of the total silicon, it can best be detected by a microscope. Mr. Stead says in speaking of a test piece $\frac{5}{8}$ inch in diameter: "This section was made up of five different zones or areas. The outer has a thickness of 0.012 inch and consisted of iron and diffused silica. The silica appeared as a deposit in the joints of the iron crys-

tals. This peculiarity does not appear to have been noticed before, but 15 years ago I had occasion to examine a thick metallic but very rotten scale from certain malleable castings, which proved on analysis to be iron and free silica, the latter amounting to the same equivalent proportion of silicon existing in the solid sound metal below the scale. The explanation was clear enough. The oxidation had been carried too far and the silicon had actually been oxidized to silica, which, not being a gas like the oxides of carbon, remained in situ amid the crystals of iron."

With regard to my own experience I have never found any loss in silicon during the annealing, even when repeated several times. To illustrate, I give analysis of 1-inch bars from different heats before and after annealing, during which about one-fourth of the carbon was removed:

Number.	Unannealed silicon.	Annealed silicon.
1.....	0.45	0.47
2.....	0.69	0.715
3.....	0.56	0.553

These bars were annealed in mill scale, as were those mentioned by Mr. Stanford. Mr. Stead's bars were annealed in lime, while Mr. Royston used ore and a number of other substances such as limestone, sand, charcoal, &c. I am aware that one of the older writers on malleable iron claims that annealing in charcoal causes a loss in silicon and that a mixture of colcothar and salt has the same effect. Analytical methods have been much improved of late years, and certainly the researches of Mr. Royston and Mr. Stanford do not show loss in silicon in any method of annealing used by them. It would be of much interest, I think, to all malleable iron men if Mr. Wheeler will give a little fuller explanation of his statement and methods used in annealing.

GEORGE C. DAVIS.

PHILADELPHIA, Pa., March 3, 1899.

OBITUARY.

JOSEPH P. MASON.

Joseph P. Mason, the New York representative of Morris Wheeler & Co., iron and steel manufacturers, of Philadelphia, died suddenly from heart disease at his office, 29 Broadway, New York City, on March 2. Mr. Mason was 51 years of age.

REUBEN F. RICHARDS.

Reuben Francis Richards, a leading wholesale metal merchant of Boston, Mass., and head of the old established firm of Richards & Co., died at the Hotel Manhattan in New York on February 26, of blood poisoning. Mr. Richards was born in Boston 35 years ago and was the son of Reuben Augustus Richards. At the death of his father, in 1893, he succeeded him as head of the firm of Richards & Co., making the fourth generation who had conducted the business under the same name.

WILLIAM G. JOHNSON.

William G. Johnson, president of the Athol Machine Company, died on March 1 at Athol, Mass., after a prolonged illness. He was born in Dana, Mass., and moved 38 years ago to Athol, where his father possessed large business interests, to which the son eventually succeeded.

GEORGE O. BASLINGTON.

George O. Baslington, treasurer and general manager of the Chapin Bolt & Nut Company, Cleveland, Ohio, died February 26, after a short illness from pneumonia, aged 66 years. He was born in Brookfield, Mass., and went to Cleveland in 1849. He had lived in that city ever since and had been identified with several business enterprises during his long business career.

THOMAS HOBART.

Thomas Hobart, a former iron manufacturer of Cleveland, Ohio, died on March 4 at the home of his son-in-law, H. P. Smith, at East Orange, N. J., from erysipelas. He was born at Hanson, Mass., in 1819, and became a machinist. Later he went to Cleveland, Ohio, where he entered the employ of Otis & Co., in which firm he ultimately became a partner. Mr. Hobart retired from business in 1885.

FREDERIC COOK.

Frederic Cook, one of the best known and most highly esteemed citizens of New Orleans, La., died on February 26, at the age of 70 years, from pneumonia following an attack of the grip. He was born in London, England, and went at an early age to Canada. Later he came to this country and entered the employ of the Novelty Iron Works in New York City, in which he subsequently secured an interest. Some time before the war Mr. Cook went to New Orleans, where, under the firm name of Cook & Collins, he established the Belleville Iron Works, mainly for the manufacture of sugar machinery. The business

was interrupted by the outbreak of the Civil War, and Mr. Cook at its close returned to Canada, where he was for a time engaged in the development of oil wells. He did not, however, remain a great while in Canada. Disposing of his oil interests he returned to Louisiana and engaged in sugar planting. After running a plantation for several years he invested in the arrow cotton tie, which soon went into general use, and this business required all of his attention until the expiration of the patent.

HUBERT S. CHADWICK.

Capt. Hubert S. Chadwick of Charlotte, N. C., ended his life on March 2 by shooting himself at the Parker House, Boston, Mass., while under temporary mental derangement. He was well known in the South as agent for a large number of firms which manufacture mill machinery. A native of Vermont, he went South some 12 years ago as Southern agent for the Franklin Machine Company of Providence, R. I. Later he resigned that position and located at Charlotte, N. C., where he established the Charlotte Machinery Company, of which he became the president. During the late war he served as captain of a military company under General Fitzhugh Lee, and contracted an illness which is believed to have unbalanced his mind.

HENRY G. MARSHALL.

Henry George Marshall, president of the Prentiss Tool & Supply Company, died on March 6 of pneumonia at the Hotel Endicott, New York City, aged 65 years. He was born at St. John, N. B., and came to New York in 1845. Mr. Marshall was a partner in the New York banking firm of Frazier & Co.

WILLIAM FAUX.

A somewhat remarkable career was terminated by the death, on February 19, at his residence in Philadelphia, Pa., of William Faux. His history is thus given by the Philadelphia *Ledger*: He was born in Northumberland County, Pa., 84 years ago, and began life as a farmer. Then he engaged in the purchase and sale of iron, a business which he extended over the entire country, largely in the South, where he bought up the discarded rails of a number of roads and sent them North by the shipload. When the Civil War broke out he engaged in some daring ventures in purchasing cotton from the Confederates, and during General Butler's rule in New Orleans Mr. Faux was given charge of a number of sugar plantations in Louisiana abandoned by their owners, which he successfully, but at great personal risk, cultivated for two years, with negro help, at a large profit. After the war his attention reverted to the iron business, and he invested a large amount of money in establishing a rolling mill at Danville, Pa., an enterprise in which he became embarrassed by the panic of 1873. At this juncture he was induced by the presidents of the Atchison, Topeka & Santa Fe and the Denver & Rio Grande railroads to move his mill from Danville to Denver, a field that was thought to offer great chances to a pioneer rail manufacturer in that new region. The removal of such a large plant this distance was regarded at the time as a great feat of business pluck and energy, but the enterprise proved to be premature in that region, and promises made the energetic proprietor were not realized, with the result that embarrassment compelled him to sell his plant at a great sacrifice. Mr. Faux then turned his attention to prospecting in the silver districts of Colorado and New Mexico, with indifferent success, and changed his field of operation to the manganese iron ore beds of Cuba, he being among the first to discover and locate the manganese deposits in the neighborhood of Santiago but without realizing a profit from his enterprise. He went to Philadelphia about ten years ago, and, notwithstanding his advanced age, continued prospecting for different minerals in Pennsylvania and Virginia, ceasing his activity in that line within the last year of his life.

The Ivanhoe Furnace of the New River Mineral Company, Ivanhoe Furnace, Va., was blown out on February 17.

One Ashland Furnace, at Ashland, Ky., was blown out for repairs.

Furnaces 1 and 2 of the Marting Iron & Steel Company, Ironton, Ohio, will be in blast May 1.

The Lawrence Furnace of the John Peters Iron Company, Ironton, Ohio, has been blown out to reline.

Rock Run Furnace of the Bass Furnace Company, Rock Run, Ala., has been blown out for repairs.

The Lukens Iron & Steel Company, Coatesville, Pa., have increased the wages of their employees 10 per cent., to take effect April 1.

PERSONAL.

W. H. Singer has resigned as a member of the Board of Managers of the Carnegie Steel Company, Limited, and his place has been filled by Thomas Morrison, superintendent of the Edgar Thomson Steel Works.

Henry Wick, formerly president, and Wm. H. Baldwin, secretary of the Ohio Steel Company, Lee Claire Hoover, formerly auditor, and Edwin McEwen of the Union Iron & Steel Company at Youngstown, which plants have been taken over by the National Steel Company, have removed from Youngstown to Chicago, and will make their permanent residence in that city.

J. R. George, chief engineer of the Joliet Works of Illinois Steel Company, has resigned his position to become a member of the engineering force of Morgan Construction Company, Worcester, Mass.

The *Electrical Engineer* and the *Electrical World* will henceforth be issued weekly as the *Electrical World and Electrical Engineer*, under the editorship of T. Comerford Martin and W. D. Weaver. Joseph Metzler, for many years one of the editors of the *Electrical Engineer*, retires to devote himself entirely to the *Electrical Engineer* Institute of Correspondence Instruction.

The Cambria Steel Company have appointed George B. Tennant, formerly with Post & McCord, the superintendent of the structural steel department.

William H. Bausch, treasurer of Bausch & Harris Machine Tool Company, Springfield, Mass., returned from Europe March 2 and reports a successful business trip. On the same steamer arrived Charles Clark Adams of Sargent & Co.'s Boston office.

Ex-Governor William R. Merriam of Minnesota has been appointed by the President as director of the next census. The office of assistant director, it is expected, will be conferred on William C. Hunt of Massachusetts.

Moses Taylor, who has been connected with the Lackawanna Iron & Steel Company for some years, has been elected vice-president of the company at a recent meeting of the Board of Directors.

Charles Bell of Bell Brothers, and W. H. Panton, long connected with Dorman, Long & Co. of Middlesborough, England, have sailed for a visit to this country. They propose to study American basic open hearth plants in the interest of the large new works which the two concerns now consolidated are about to erect.

W. L. Cathcart, who graduated at the Naval Academy in 1875, resigning in 1891, and subsequently in 1897 became instructor in marine engineering at the Webb Academy, has been appointed Adjunct Professor of Mechanical Engineering at Columbia University, New York.

Geo. Greer, formerly president of the New Castle Steel & Tin Plate Company at New Castle, Pa., until they were absorbed by the American Tin Plate Company, has been appointed manager of all the mills in New Castle owned by the latter company. Mr. Greer now has charge of the plants formerly operated by the New Castle Steel & Tin Plate Company and the Neshannock Sheet & Tin Plate Company, and will also have charge of the 30-mill plant under erection by the Shenango Valley Steel Company, which has been taken over by the American Tin Plate Company. Chas. Greer, who was secretary of the New Castle Steel & Tin Plate Company, has been appointed assistant manager. It is expected to have the new 30-mill plant ready for operation in a very short time.

Edward W. Martin, treasurer of the Lalance & Grosjean Mfg. Company, New York, has retired on a pension after 29 years' service and James Cochrane, secretary of the company, has been appointed to fill the office of treasurer in addition to that of his former position.

Geo. S. Griscom of Pittsburgh sailed for Europe on Saturday, March 4, for an extended visit.

Wm. P. Snyder, the well-known iron and steel merchant of Pittsburgh, has been very ill for six weeks or more, and is still in a critical condition. Should he recover sufficiently to permit he will go South for an extended visit to build up his shattered health.

Charles M. Schwab, president of the Carnegie Steel Company, Limited, who is in Europe, sails for home on March 11.

Lucius E. Cochran of the Andrews Brothers Company, Youngstown, Ohio, has been seriously ill for some time.

At Pittsburgh the Philadelphia Company, who have recently taken over the properties of the Philadelphia Natural Gas Company, the Chartiers Natural Gas Company and the Allegheny County Light Company, have purchased the properties of the Union Gas Company and the Tube City Gas Company, both of McKeesport, Pa.

The Nernst Electric Light.*

BY JAMES SWINBURNE.

The lamp I describe to-night is the invention of Prof. Walther Nernst of the University of Göttingen. Though he is a young man, Professor Nernst's name is already known to all modern chemists as a leading authority and original thinker in the field of physical chemistry. It is unusual for a man who has climbed to the top of one tree to jump to the top of another. Nernst's, like most great inventions, is exceedingly simple as soon as it is understood. The efficiency of an incandescent body, as far as radiation goes, depends simply on the temperature. The efficiency of an incandescent lamp, for instance, depends on the temperature of the filament only, providing there is no loss by convection. The carbon will not stand a sufficiently high temperature, especially as, in addition to its low specific resistance, the filament has to be long and slender, and thus weak. Nernst, therefore, chose a material that would stand higher temperatures than carbon, and his material has the incidental advantage that its specific resistance is so high that strong rods can be used for high pressures instead of thin filaments. The most refractory materials so far used in lighting are zirconia, which has been used to replace lime in the lime-light, and the oxides or so called rare earths in the Welsbach mantles. I am aware, of course, that many people suppose that the Welsbach mantle is not very hot, treating it as if it were at a temperature, for instance, below the melting point of platinum. The light emitted is supposed to be due to some special power of selective emission due to the oxides employed. I have had a good deal to do with incandescent gas mantles, and I find no reason to suppose there is any magic effect of this sort going on. The part of the flame where the mantles hang fuses platinum wire easily, and very few materials can stand the temperature without fusing or volatilizing. Lime and many other oxides volatilize slowly from the mantles. I do not mean that the mantles are above the boiling point of lime; I have some idea of its melting point, as I have made a few pounds of melted lime and run it out on the floor to look at it. The Welsbach mantles, which are now chiefly thorium, are at a temperature near their softening point, and in the making are raised to a temperature at which they begin to soften.

Nernst takes highly refractory oxides as his material. It does not seem promising, because such oxides are notoriously good insulators. But such insulators are electrolytes when hot; Nernst, therefore, heats the rods to make them conduct, and then heats them electrically, preserving a temperature which is within the limits that the material can bear without softening. This means that he can take the most refractory bodies supplied by the whole range of chemical research and can heat them to a temperature short of their softening point, and can thus get an efficiency unknown to workers on the incandescent lamp. Such efficiency also means whiteness of light, so long as the efficiency is not too high. Thus the crater of the arc being at a temperature of boiling carbon gives a light that is unpleasantly blue. The material is worked up into little white rods. Each rod is mounted on two platinum wires, a little paste made of refractory oxides being applied to the joints. The little rod with its two wires is then mounted in a holder which fits ordinary electric light fittings. As the rods fall in resistance as the temperature increases, after the manner of electrolytes, an increase of current produces a decrease of resistance. This tends to give some instability in running in parallel on supply circuits. This instability is corrected as in an arc lamp, which has analogous properties due to a different cause, by a series resistance. The Nernst rod has therefore a resistance in series. This is made up of exceedingly fine wire, and for ordinary circuits amounts to 10 or 12 per cent. of the whole resistance of the lamp. The consumption, including the resistance, is 1.5 watts per candle for large lamps and 1.6 for small lights or low pressures. In small or low pressure lamps the loss of heat at the ends is larger in proportion.

Such a lamp as I have described will not light up of itself, for the rod is an insulator when cold. The simplest way to start it is to warm it up with a match, or, better, with a small spirit lamp. Such a lamp as this is not only very cheap as regards first cost, but very economical in running. The life of rods, running at an efficiency of two thirds of a candle per watt, including the resistance, is already more than 500 hours in good specimens. If the Nernst lamp advances as much in the first few years of its existence as the carbon lamp did between 1880 and 1882, it will soon be made so well that the rods will last a lifetime. When the rod is worn out a new rod with its wire mounts is all that is replaced. The whole lamp is not thrown away at all. The method of lighting I have described, though it may be used in many cases, such as large public rooms, is really a savage mode of ignition, fit

only for dealing with uncivilized commodities, such as gas and tobacco. The small lamps and lamps of medium size are in practice started by a heating resistance. This is arranged close to the rod, and in shunt to it. As soon as the rod is hot enough to conduct, its current works a tiny cut out in the resistance circuit. In large lamps the heating system is a little more elaborate, as the resistance arrangement is arranged as a sort of hood which covers the rod. As soon as the rod conducts, not only is the resistance circuit broken, but the electro magnet lifts the little hood clear off the rod. In all these forms the rod and its mounting are replaceable without interfering with the rest of the lamp.

We now have to consider the part the Nernst lamp is probably going to play in the near future. Compared with the small incandescent lamps, as you deal with a material of much higher specific resistance, it is easy to give both small lights and high pressures. The question of lighting is exceedingly important, though it appears trifling at first sight. People are so accustomed to lamps being turned on from the door without any further trouble that they will generally object to having to light them with matches or spirit lamps, but there are many cases in which it will be quite satisfactory to have one lamp with an automatic lighter to show you the way into the room, the rest being lighted with matches or a spirit lamp as needed. There will be, however, a considerable opening for the cheap, small power, high efficiency lamp, and the disadvantage as to lighting in such cases as *cafés*, restaurants, churches, hotels, railway stations and, in short, in most public rooms, is small.

Coming now to the next size,—that is to say, lamps of 20 candle power to 200 candle power,—and even small lamps in which it is worth while to have automatic ignition, the first cost of such lamps will be higher than the first cost of incandescents, but as the rod itself has alone to be replaced that is a matter of very slight importance. This size of the Nernst lamp has, further, every chance of completely ousting the carbon incandescent on the score of cheapness as to renewals, higher efficiency, better colored light and perhaps more especially high pressures. Once the Nernst lamp becomes so general that systems of distribution are laid out to suit it, instead of to suit the carbon lamp, the carbon lamp is practically out of the running. It must be remembered that the Nernst can compete with the carbon filament at any pressure that suits the filament, but the Nernst lamp can easily go right out of the depth of the filament and have the higher pressures to itself. It must be remembered that at present the cost of cables in a system of distribution is an exceedingly large item.

Turning now to the large lamps, they compete with the arc lamp in efficiency. Of course the efficiency of the arc lamp is not a very definite quantity. The candle-power is generally determined by multiplying the current by two and adding zeros at discretion. All I can say is that however many zeros the good nature of the maker may supply, a Nernst lamp taking the same power gives a better light. When carefully arranged on the photometer the arc may be better in given directions, but a lot of light given in directions that you do not want is not the same as the same light distributed with a uniform spherical emission. The arc lamps shown here will give the audience a good idea of the relative values. The Nernst gives a pleasanter and of course a perfectly steady light. Coming to costs, the Nernst will be very much cheaper in first cost, but enormously cheaper in maintenance. It also goes quite away from the arc as to pressures. There is no trouble, for instance, in making large lamps to work in parallel at 500 volts, and by using double rods at 1000 volts. This puts an entirely new development of electric lighting in the hands of the engineer.

The Lackawanna Billet Mill.—Reports have been current lately to the effect that the Lackawanna Iron & Steel Company of Scranton, Pa., had decided to build a new steel plant and billet mill at Lebanon, Pa. While such a project has been under consideration for some time, it has not been decided as yet to carry it out. The advantages of such a location in the vicinity of the furnaces leased and controlled by the Lackawanna Company are manifest.

Following the recent advances in wages in the Massachusetts and New Hampshire mills a general restoration of the scale of wages prevailing before January, 1898, has been made in the Maine cotton mills.

The New Jersey Legislature has passed a law compelling corporations, firms and individuals to pay their employees in cash at least once in two weeks—exception is made in favor of railroads and farmers. The law was introduced to remedy a condition existing in the glass blowing district of South Jersey, where employees are paid off in orders, which they must trade out in stores operated by their employers.

* Abstract of paper read before the Society of Arts, London.

MANUFACTURING.

Iron and Steel.

Taking effect on March 1, an advance of 10 per cent. in wages of common labor in all tin plate plants in the Pittsburgh district owned by the American Tin Plate Company went into effect. The advance is the same as made in all the plants owned by this company throughout the United States.

We are advised that the report that the La Belle Iron Works, Wheeling, W. Va., would build a new cut nail factory is untrue. J. E. Wright has been made president of this concern, succeeding Cecil A. Robinson, and W. E. Beswick has been made secretary.

Potts Brothers, operating the Pottsgrove Iron Works, at Pottstown, Pa., and manufacturers of boiler plate, tank and flue iron, have notified all their employees of an advance in wages to take effect April 1. They report a large number of orders on hand, and are running their works to full capacity in all departments.

At the plant of the Shenango Valley Steel Company, New Castle, Pa., now owned by the National Steel Company, copies of the following notice have been posted: "On and after March 1, 1899, wages of all employees of the Shenango Valley Steel Company will be increased as follows: Employees receiving \$1.50 per day or less, 10 per cent.; employees receiving over \$1.50, but not over \$2 per day, 7½ per cent.; employees receiving over \$2, but not over \$2.50, 5 per cent."

The limited partnership of Park Brother & Co., Limited, operating the Black Diamond Steel Works, at Pittsburgh, is to be reorganized into a corporation to be known as the Park Steel Company, with a capital stock of \$10,000,000. The officials will be W. G. Park, president; D. E. Park, vice-president, and D. C. Clapp, secretary and treasurer.

Last week Councils of Pittsburgh passed an ordinance vacating a certain number of streets in the vicinity of the American Iron & Steel Company, of Jones & Laughlins, Limited, on the S. S. Pittsburgh, to allow that concern to make some large additions to their plant. It is the intention of this concern to erect several puddling mills and make other additions, which will very much increase their present output. At the present time this firm are turning out over 2000 tons of finished material per day. Pittsburgh Councils have also passed an ordinance vacating certain streets in the Seventeenth and Eighteenth Wards, Pittsburgh, adjacent to the Keystone Bridge Works of the Carnegie Steel Company, Limited. It is the intention to about double the size of this plant, and the city has vacated the streets in order to allow these extensions to be made.

Owing to the fact that the American Tin Plate Company, who took over the two-mill plant of the Johnstown Tin Plate Company, at Johnstown, Pa., will not operate it, a movement has been started among some parties at Johnstown looking to the building of a six-mill tin plate plant. It is proposed if the project goes through to buy the tin plate equipment abroad if necessary. At present the matter is being thoroughly canvassed, and definite action one way or the other will be taken in a short time. The people at Johnstown feel that it is a good location for a tin plate plant, and believe one could be built and successfully operated there.

Fannie Furnace, at West Middlesex, Pa., owned by Lloyd G. Reed of Erie, and which has been idle for some time, will be rebuilt and improved and put in blast at an early date. This furnace was formerly operated by the Wheeler Furnace Company and E. A. Wheeler was superintendent.

The report that the Shoenberger Steel Company of Pittsburgh had made a shipment of 500 tons of plates to the Netherlands is untrue. This concern have had an opportunity to figure on a good deal of foreign business, but owing to the heavy domestic demand, which takes their entire product, they have been unable to take advantage of any foreign trade offered them.

The Sharon Iron Company, Limited, Sharon, Pa., who have practically been taken over by the National Steel Company, have purchased Sharon Furnace, at Sharon, Pa. The stack is 60 x 14 feet, was built originally in 1845 and rebuilt in 1882 and 1891. It has five iron pipe stoves, and has an annual capacity of about 45,000 gross tons. It was owned by Norman Hull of Sharon and James Rawle of Philadelphia.

The Pennsylvania Steel Company, Steelton, Pa., will make a general advance in wages of all employees of about 10 per cent., taking effect about April 1.

The blast furnace owners in the Mahoning and Shenango valleys have decided to restore wages to the basis in force in 1896. The advanced wages are now as follows: Laborers, \$1.30; fillers, \$1.65; fillers' helpers, \$1.50; casting house helpers, \$1.65; hot blast men, \$1.65; keepers, \$1.90; top fillers, \$1.80; cinder men, \$1.65. The advance averages about 10 per cent.

The Pennsylvania Bolt & Nut Company, Lebanon, Pa., manufacturers of machine bolts, screws and track bolts, have made an advance in their puddling and rolling mill departments of 10 per cent. in wages, to take effect April 1. About 800 men are affected by the increase.

At the Lebanon Rolling Mills, Lebanon, Pa., notices of an advance in wages have been posted.

We have been officially advised that the report that the Brown-Bonnell Iron Company, Youngstown, Ohio, have purchased Douglass Furnace, at Sharpsville, Pa., is incorrect. Some negotiations in this direction have been made, but the firm have not as yet purchased or leased any blast furnace.

The Maryland Steel Company, Sparrow's Point, Md., have made an advance in wages of all employees of 10 per cent.

The transfer by the Iroquois Furnace Company of the Iroquois Furnace at Chicago, necessary to complete the sale to Rogers, Brown & Co., has gone to the records, the consideration being \$475,000. The grantee has given to the grantor a trust deed to secure \$400,000, purchase money, for 10 years, with interest at 4 per cent. The property has a frontage on the Calumet River of 1100 feet, north frontage on Ninety-fifth street of 557 feet, an east frontage on Avenue O of 1731 feet, and 250 feet on the right of way of the Baltimore & Ohio Railroad.

The Illinois Steel Company shut down their rail mill at South Chicago February 18 to make necessary repairs. The mill had been running almost continuously for over two years. Advantage was taken while the mill was idle of the opportunity thus afforded to make improvements in the converting department which had long been contemplated. The plant was arranged so as to cast on cars instead of continuing the use of the old fashioned pit. Considerable labor is thus dispensed with and much time is saved. The cranes were all changed, new stripper buildings were erected, new boilers were added and other changes were made of considerable importance in increasing the efficiency of the works. Although so much was done, the rail mill was expected to be in shape to resume operations early this week, the company having too large a tonnage booked to take a minute longer than actually needed. The new slabbing mill was turned over for the first time on Wednesday of last week, the tables having been previously tested. It is expected to be in operation regularly this week.

The Bethlehem Iron Company, Bethlehem, Pa., announced on March 6 an advance of 10 per cent. in the wages of their common labor, which affects over 500 men.

The puddlers employed in the Portage Iron Works, Duncansville, Pa., have received notice of an increase of 25 cents a ton. All other employees will have a 10 per cent. increase in wages. This advance affects 500 men.

The Baker Chain Company, Pittsburgh, Pa., have advanced the wages of all their employees from 5 to 10 per cent. The increase affects 300 men.

Employees of the Warwick Iron Company, Pottstown, Pa., have been notified of a 10 per cent. increase in wages on March 1.

The Michigan Iron & Steel Company, who have been organized to operate the rolling mills at Muskegon, Mich., have elected the following officers: President, D. M. Hillis; vice-president, J. C. McLaughlin; secretary and treasurer, John E. Jones.

The Crane Iron Company of Catasauqua, Pa., have blown in their No. 3 Furnace, and it is expected that repairs will be started on the No. 4 Furnace early in March. An advance of 10 per cent. in the wages of their employees was made by this company last month.

The Baker Chain & Wagon Iron Mfg. Company of Allegheny, Pa., have made a voluntary advance in wages in all departments. The employees getting \$2.25 per day and less have been advanced 10 per cent., and those receiving \$2.50 and more 5 per cent.

J. Painter & Sons Company of Pittsburgh are shipping a large order of skelp iron to Glasgow, Scotland.

The Eriev Hill Iron & Coal Company, Youngstown, Ohio, recently made a shipment of 47 cars of pig iron to Genoa, Italy.

Sharpsville Furnace, at Sharpsville, Pa., which has been idle for some time, is being prepared for blast.

After being idle for more than 12 years the rolling mill of the Philadelphia & Reading Railroad Company at Reading, Pa., which belongs to the Reading Iron Company, will be put in operation in a short time. Orders have been given to repair and start the puddle mill as soon as possible, after which the other mills in the plant will be converted into skelp and bar mills.

The Mahoning Valley Iron Company, Youngstown, Ohio, manufacturers of iron and steel bars, skelp and polished shafting, are running their shafting works double turn, the first time in a number of years. This concern advise us that they have large orders on hand and are running all departments of their plant to utmost capacity.

The American Steel & Wire Company will replace their engine in their rod mill at Beaver Falls Works, Beaver Falls, Pa., with a new one of about 1500 horse-power. The one now in use has been proven to be too light.

The Riverside Iron Works, Wheeling, W. Va., have notified all their employees of a 10 per cent. advance in wages. It is said about 3000 men are affected.

Moorhead Brothers & Co. of Pittsburgh have given their puddlers an advance of 20 cents a ton, making the rate \$4.20 a ton.

On Monday, March 6, the stockholders of the Bellaire Steel Company, Bellaire, Ohio, received the dividends on the surplus and earnings since the option on the stock was taken. It amounts to about 24 per cent.

Machinery.

The firm of Wm. B. Pollock & Co., Youngstown, Ohio, manufacturers of boilers, stacks and plate iron work of all kinds, have been succeeded by the Wm. Pollock Company, a corporation, with a capital stock of \$100,000. The following Board of Directors have been elected: Wm. B. Pollock, Porter Pollock, W. B. Jones, C. W. McClure and W. W. McKelvey. The board organized by electing Wm. Pollock president, Porter Pollock vice-president and manager, and W. B. Jones secretary and treasurer. The concern have recently made some improvements in their plant in Youngstown, and it will be their policy to still further enlarge their capacity as their rapidly increasing business may require.

Fred. J. Swaine, St. Louis, Mo., builder of sheet metal presses, is preparing to move into a building now under construction and arranged to better meet the demand from metal goods manufacturers for new machinery.

Burnham, Williams & Co. of the Baldwin Locomotive Works, Philadelphia, have bought the Bush Hill Iron Works property, bounded by Sixteenth, Buttonwood and Spring Garden streets, from the estate of James Moore, and will use it for an extension of their great plant.

The American Insulating Material Mfg. Company, St. Louis, Mo., whose unique plant for making insulating wool out of Missouri granite rock was recently destroyed by fire, are actively engaged in rebuilding. They state that their output has been sold up some months ahead and that granite wool is being tested by the Brazilian Government and the Moscow (Russia) water works for filtration purposes.

The S. Freeman & Sons Mfg. Company, Racine, Wis., are running their boiler department to its full capacity. They have turned out during the last three months several large marine boilers for the Pacific Coast, and now have on their floor an exceptionally large fire box marine boiler for the steamer "Flyer," navigating Puget Sound. They also have in process of construction six large fire box boilers for the Tamarack Mining Company. The demand for standard horizontal tubular boilers continues excellent, and their order books show that their Economizer boiler is increasing in favor for dairies, creameries, &c. They anticipate an extraordinary year in all products which they manufacture.

Henry E. Pridmore, manufacturer of the Pridmore molding machines, 111 and 113 West Harrison street, Chicago, has purchased a large tract of land on the southwest corner of Nineteenth and Rockwell streets, in that city, and will immediately proceed to erect a machine shop and foundry. The machine shop will be 60 x 100 feet, two stories high, and the foundry 60 x 150 feet, one story, with steel roof. These buildings are expected to be ready for use by the 1st of May. Mr. Pridmore has for a long time contemplated the building of shops for himself, finding the demand for his machines running much beyond the facilities afforded in his present quarters. The location was selected after a careful comparison of the advantages presented by many places. It has direct railroad connections with prominent systems and is at the same time not too distant from the business center of Chicago. When the plant is completed it will have the distinction of being the only one in the United States exclusively devoted to the manufacture of molding machines.

At a meeting of the stockholders of the Westinghouse Machine Company, held in East Pittsburgh last week, it was decided to increase the capital stock from \$1,500,000 to \$3,000,000. The increased capital will be used to facilitate the operations of the company on a much larger scale than at present. Work will soon be commenced on the erection of new buildings and the installation of equipment to double the present capacity of the works in East Pittsburgh. The company will engage in the manufacture of large rolling mill engines, and to do this have placed orders for some of the heaviest machinery equipment ever built. Heretofore this concern have confined themselves largely to the manufacture of medium sized engines, but it is their purpose to make engines of the heavier type.

The Marion Steam Shovel Company of Marion, Ohio, have recently sold a model K machine for the Biwabik Mine on the Mesaba range and a model G for Gulbranson Brothers for stripping work. The Marion Steam Shovel Company have sold recently 12 large steam shovels and a dredge for shipment to Russia.

The Board of Trade Commissioners of St. Paul, Minn., have awarded the Pittsburgh Meter Company, East Pittsburgh, Pa., the contract for supplying the city of St. Paul with water meters for the year 1899, this being the third successive year that these meters have been used in St. Paul.

The Westinghouse Electric & Mfg. Company of Pittsburgh, Pa., have received from Europe a large number of contracts for electrical machinery. Some are for entirely new installations while others cover supplementary apparatus, where the original contract had been made some time since. An electric railroad is about to begin operations in Rouen, France, for which the Westinghouse Company are now constructing six car equipments, including motors and controllers. The contract also covers two 15-kw. generators for the power house. The Glasgow Corporation of Tramways, who some time ago made a

contract with the Westinghouse Company for a large amount of electric railway apparatus, have recently given another contract for 25 car equipments. The Dudley Corporation of Tramways of Dudley, England, have contracted for one 100-kw. generator, to be operated by a Westinghouse steam engine, and one 200-kw. generator, which is also to be operated by an engine of the Westinghouse Machine Company's manufacture. The contract also calls for switch boards and other necessary auxiliary apparatus. The Bradford Tramway Corporation of Bradford, England, have sent in a supplementary order for eight additional car equipments, which make 24 equipments ordered from the Pittsburgh concern.

The Lloyd Booth Company, Youngstown, Ohio, manufacturers of rolling mill and tin plate machinery, have recently installed a 15-ton electric traveling crane, made by the Shaw Electric Crane Company of Muskegon, Mich. The plant of the Lloyd Booth Company is running full, and they are contemplating adding an addition to their machine shop, and the installation of several large tools.

Reade & Bowler, Cleveland, Ohio, sold last week the complete plant of the Galland-Henning Pneumatic Malting Drum Company of Buffalo, N. Y., to Eastern parties.

Among recent sales made by Edward J. Etting, agent in Philadelphia and vicinity for the Whiting Foundry Equipment Company, may be mentioned an electric three-motor crane to the Diamond Drill Machine Company, Birdsboro, Pa.; two electric three-motor cranes and two Whiting cupolas to the Harrisburg Foundry & Machine Company, Harrisburg, Pa.; one three-ton jib crane to W. F. Mosser & Sons, Allentown, Pa.; a compressed air system and lot of traveling cranes to the Frankford Arsenal, Philadelphia; air hoists, ladies and general foundry equipment to the York Mfg. Company, York, Pa., and the Ferro-Carbon Castings Company, and Bettinos Bros., Philadelphia. Among recent sales made by Edward J. Etting of Pridmore molding machines are A. Buch's Sons, Elizabethtown, Pa., the Abram Cox Stove Company and the Hocks Smelting Company, Philadelphia.

The Filer & Stowell Company of Milwaukee, Wis., have found it necessary within the past 30 days to refuse more orders for engines than they found it possible to accept. Arrangements are now being made to double the capacity of the foundry, so as to make it possible to get out the necessary castings to keep all of the tools in the machine shop running day and night. The engine orders now on the books are sufficient to supply the engine department with work for the next six months. Among the more prominent engines for which orders have been received are the following: A 2000 horse-power cross compound to be shipped to Providence, R. I., for the Union Railroad Company of that city, to have cylinders 22 and 54 inch bore, 48-inch stroke. The fly wheel is to weigh 100,000 pounds, and to have cast steel ring 6 inches thick shrunk on the rim. This ring will be 24 feet in diameter, made in one piece, and must be shrunk on after the wheel is in position. Another engine building is a 250 horse-power tandem compound for the Washburn & Moen Mfg. Company, Worcester, Mass. The Edison Electric Light & Power Company of Erie, Pa., have placed an order for a 1000 horse-power cross compound, having cylinders 24 and 44 inch bore, 48-inch stroke. The engines which are to furnish the power for the generators at the central power station of Armour & Company consist of two cross compounds of 1000 horse-power each. These two make in all 10 engines which Armour & Co. have ordered from the Filer & Stowell Company within the last two years.

The new 30-mill plant of the American Tin Plate Company, New Castle, Pa., will be put in operation as soon as the works can be completed, which they hope to have far enough along to start early in April, which depends, however, on the time required for the railroads to complete high trestle tracks for delivering coal to boilers and furnaces. The extreme cold weather in February shut off all work at this new plant, and has delayed its completion materially. This will be the largest individual tin plate plant in the United States, and will be under the management of George Greer, President of the New Castle Steel & Tin Plate Company.

The Lukens Iron & Steel Company, Coatesville, Pa., manufacturers of steel and iron plates, have placed a contract for the building over their new open hearth plant, under penalty to be erected by June 1, with W. W. Lindsay & Co. of Philadelphia, Pa. They have purchased part of their machinery, but part is still under negotiation. A 75-ton electric ladle crane has been purchased from the Morgan Engineering Company, Alliance, Ohio.

The Cambria Steel Company, Johnstown, Pa., have declared the regular dividend of 1 1/4 per cent.

Westinghouse, Church, Kerr & Co. of Pittsburgh are about to make a large shipment of compound engines to the Dudley Corporation, Staffordshire, England. This firm have just received a large order for engines for the Compagnie Générale de Traction de Paris.

The New England Foundry & Machine Company of Jersey City, N. J., have been incorporated to manufacture special machinery, tools, &c., with a capital of \$100,000, by Charles F. Hoyt, New York; Charles E. Seldon, Middletown, N. Y.; R. H. Desmond, Cranford, N. J.

Dupont Mfg. Company, St. Johnsbury, Vt., who manufacture the Dupont power hammer, the Howard mitering and beveling saw table, the Howard saw sharpening machine and the Dupont tire setter, are sending out an illustrated pamphlet, and advise us that their business is particularly good at this time and that their sales in foreign countries have been large. The Dupont power hammer has been on the market for some time, and it is stated that it has less parts than any other power hammer. It is easy of adjustment, economical of power, has great durability and range of work.

In the matter of foreign shipments, Henry R. Worthington has recently taken orders for pumping engines for the water supply of the following places: Amiens, France; Ryde, Isle of Wight, England; Besancon, France; Verrins, France, besides a horizontal compound condensing engine for the Disgyor Steel Works in Hungary.

The contract for equipment of the wire drawing and galvanizing plant of Page Woven Wire Fence Company at Monessen, Pa., has been placed with the Morgan Construction Company, Worcester, Mass.

The Economy Foundry Company, Syracuse, N. Y., have increased the wages of their 100 employees 10 per cent.

The Vulcan Iron Works, Tamaqua, Pa., which have been idle for more than a year, will, it is reported, soon resume operations with contracts on hand that will occupy the plant for a year.

A dispatch says that the Petersburg Iron Works Company of Fredericksburg, Va., have been awarded a contract by the United States Government for 1500 6-inch shells, for sea coast defense, to be delivered during the next six months.

At the recent annual stockholders' meeting of the National Machine Company, Hartford, Conn., the following officers were elected: President, Charles E. Billings; vice-president, Silas Chapman, Jr.; treasurer and general manager, S. M. Bronson; secretary, W. F. Loomis; superintendent, H. H. Stach.

The Munson Bros. Company of Utica, N. Y., have been organized to manufacture machinery, with a capital of \$100,000 paid in. The incorporators are A. H. Munson, E. L. Munson, F. A. Munson.

The Cleveland Crane & Car Company of Cleveland, Ohio, have been incorporated with \$50,000 capital stock. The company will engage in manufacturing cranes of all kinds, hand and power hoisting machines and general machinery. George A. Armstrong, E. I. Leighton, Charles E. Thomas, J. M. Hirschelman and A. L. Assmus are the incorporators.

The Youngstown Foundry & Machine Company, Youngstown, Ohio, manufacturers of castings and sand and chilled rolls, will probably build a machine shop, but have not as yet definitely decided to do so. Should they add a machine shop they will utilize a large warehouse building they now have. This concern are running their plant to utmost capacity and have plenty of orders ahead, among which are some for tin mill rolls.

Henry R. Worthington is equipping his large foundry at Elizabethport, N. J., with a new power house, which when fitted with tube boilers, air compressor, engines and electric plant will add over 50 per cent. to the present power equipment.

The Fischer Foundry & Machine Company of the South Side, Pittsburgh, Pa., have made the following sales of Fischer self oiling automatic engines: The American Sugar Refinery Company, Brooklyn, N. Y., one 500 horse-power; Marmet-Smith Coal & Mining Company, Raymond City, W. Va., one 250 horse-power; the Smith-Davis Mfg. Company, St. Louis, one 150 horse-power; the Pittsburgh Plate Glass Company, one compound condensing engine of 200 horse-power; the Crown Cork & Seal Company, Baltimore, two 125 horse-power; the Baltimore News, Baltimore, one 100 horse-power; Barber & Ross, Washington, D. C., one 75 horse-power; Eberhardt & Ober Brewing Company, Pittsburgh, one 100 horse-power; Winter Brothers Brewing Company, two 75 horse-power; Douglas Apartment House, Philadelphia, one 75 horse-power.

The Pennsylvania Pump & Supply Company of Pittsburgh, Pa., will make application on March 10 for a charter of incorporation. The incorporators are W. E. Ross, H. W. Sheets, Ross J. Cavanagh, G. S. Howland and John R. Cavanagh.

Charlotte Furnace, Scottdale, Pa., Corrigan, McKinney & Co., lessees, and which has been idle for some time, will be repaired and put in operation as soon as possible. The lease of Corrigan, McKinney & Co. expired in February, and the owners, the National Foundry & Pipe Works, Limited, recently taken over by the American Pipe & Foundry Company, will operate the plant, making foundry iron for their own use.

The Acme Engine Company have leased the building at 227 Third avenue, Pittsburgh, for a term of years and will carry in stock a line of engines.

The Shenango Machine Company, Sharon, Pa., will erect a new steel building and install considerable new equipment, which will almost double the present capacity of their plant.

Hardware.

The Michigan Saw Company, Saginaw, Mich., have been so busy for a long time, crowding their works to their full capacity, that they contemplate additions to their facilities. They occupy at present a two-story building, 60 x 130 feet. They

organized in 1881 and have increased their business steadily since that time. The location has been advantageous for the development of such a business, being in the heart of a great saw mill district.

Some time since the Oliver Iron & Steel Company, Pittsburgh, received an order from Hibbard, Spencer, Bartlett & Co. of Chicago for 7,000,000 carriage bolts, the sizes ranging from 3-16 to $\frac{3}{4}$ inch in diameter, and $\frac{3}{4}$ to 12 inches in length. The order was filled in a remarkably short time.

Charles H. Besly & Co., 19 and 21 North Canal street, Chicago, Ill., report large orders for their well-known Helmet oil and Perfection and Bonanza oil cups. Among others, shipments have been made to J. I. Case Threshing Machine Company, Pullman Palace Car Company, Charles Parker Company, Crane Elevator Company, Brown Hoisting & Conveying Company, Cleveland Machine Screw Company, Gormully & Jeffery Mfg. Company and Pope Mfg. Company, the last two concerns using this oil for assembling wheels, coating steel balls, as well as ball bearings and other wearing parts. The Pope Company have adopted this oil for use on their chainless wheels. The McCormick Harvesting Machine Company, Otis Elevator Company and American Steel & Wire Company are ordering Bonanza oil cups for use on their machinery.

Some time since we referred in these columns to the organization of the Pittsburgh Horse Shoe Company at Pittsburgh. This concern have recently purchased about 6 acres of land lying along the Monongahela River at Glassport, Pa., near McKeesport, Pa., and work on the construction of a plant for the manufacture of horseshoes exclusively will be commenced in a short time. The main building will be 110 feet wide and 250 feet long, not including the boiler room, cooper shop and other smaller buildings. A good deal of the machinery has been purchased and will be installed just as soon as the buildings have been erected. The company were organized with a capital of \$100,000 and expect to make about 200,000 kegs of horseshoes per year. The officers are W. C. Reitz, president; C. E. Beeson, secretary and treasurer, and a Board of Directors consisting of Wallace H. Rowe, W. C. Reitz, C. E. Beeson, W. F. McCook, attorney, and H. C. Huston.

Miscellaneous.

F. A. Walsh & Co., manufacturers of tinware and tinner's machinery, whose factory, located at Thirty-fifth and Vliet streets, Milwaukee, Wis., was destroyed by fire over a year since, have begun the erection of a large building at the corner of Reed and South Water streets, in that city. The building will be five stories high, in addition to a high basement, and will occupy a ground space of 140 x 142 feet. The materials used will be almost entirely stone, brick and iron, and the factory will cost about \$60,000. It is to be completed in about six months.

The Falcon Bronze Company of Youngstown, Ohio, are filling a large order for the Falcon Iron & Nail Company of Niles and one for the Etna-Standard Iron & Steel Company of Bridgeport, Ohio.

At a meeting of the principal officials of the Pressed Steel Car Company of Pittsburgh, held in New York City last week, all the terms and conditions of the first agreement between the Schoen Pressed Steel Company and the Fox Pressed Steel Company, both of Pittsburgh, and the Fox Pressed Steel Company of Joliet, Ill., were ratified. The Pressed Steel Car Company are now in full control of all the plants formerly owned by these three concerns and the plans outlined in the prospectus issued are being carried out. Geo. T. Hildebrand has been made assistant to President C. T. Schoen and has removed from Pittsburgh to New York. The directors of the Pressed Steel Car Company are C. T. Schoen of Philadelphia, Henry W. Oliver and W. H. Schoen of Pittsburgh, Chas. L. Treer of Detroit, H. Holly of Chicago, A. H. Larkin and E. N. Dickerson of New York City.

The Fowler Radiator Works of Johnstown, Pa., have decided to increase their plant to double its present capacity, and for this purpose will make their capital stock \$50,000, instead of \$25,000 as capitalized at present. The plant has run continuously since its establishment at Johnstown and from the high quality of the work finds itself now much behind with orders, hence the increase. The Waters Bros. are the principal owners and still retain the controlling interest in the stock.

Work has been commenced on the building for the new works of the Paige Woven Wire Fence Company, at Monessen, Pa. This concern are removing from Michigan to the above place.

The Pittsburgh Reduction Company of Pittsburgh, Pa., manufacturers of aluminum, are just completing at their mills at New Kensington, Pa., the erection of two trains of rolls to roll shapes and wire, which they expect to have in running order in a very short time. They have put in a large 34 x 42 Hamilton Corliss engine and are adding to their wire drawing department. The orders for aluminum received by this concern are large and they cannot keep up with them. There seems to have been more demand for aluminum during the past six months than ever before, necessitating the enlargement of their works at New Kensington and also at Niagara Falls, N. Y.

The American Coke Company of Pittsburgh will make application on March 13 for a charter of incorporation. The incor-

operators are William Wallace, Daniel McMahon, Ira Gribben, Morris Einstain and Harry E. Muehlbronner.

The Derwent Foundry Company of Ellwood City, Pa., will commence the manufacture of enameled bathtubs in a short time. The company have been organized with David Jamison, president; L. S. Hoyt, vice-president; J. P. H. Cunningham, treasurer, all of New Castle, and H. S. Blatt secretary and general manager. The present plant is well equipped, but there will be added modern appliances, molds and necessary machinery.

The Boston Sheet Metal Mfg. Company have been incorporated in New Jersey to manufacture corrugated iron and steel, with a capital of \$100,000, by Harlan R. Lloyd, Kenneth K. McLaren, Harry W. Meen.

The Columbian Electric Car Lighting & Brake Company of Trenton, N. J., incorporated some time ago with an authorized capital of \$2,000,000, have filed with the Secretary of State papers increasing their capital stock to \$10,000,000.

It is stated that of the proposed \$500,000 increase in the capital of the Standard Underground Cable Company of Pittsburgh, a stock dividend of 50 per cent. is to be declared, 35 per cent. of which will go to stockholders free and 15 per cent. of which the shareholders may subscribe for at \$100 per share. This will net about \$150,000 in cash. This sum, together with the present surplus of the company, will be used to erect a plant to cost about \$250,000.

The Stover Mfg. Company, Freeport, Ill., are finding greater activity in the demand for wind mills than ever before experienced at this season of the year. While their sales last year were much larger than at any previous time, they are better now than for the corresponding period last year, and the outlook is most promising. All the principal jobbers have renewed their orders for 1899 and report prospects for a largely increased business over that of last year. They have recently closed a contract with the Crane Company of Philadelphia for territory in that vicinity. The personal work done by them in Europe during 1897 is further showing itself in generous orders. The expectation is entertained that the year 1899 will be the best in the company's history.

The Truscott Boat Mfg. Company, St. Joseph, Mich., have issued a fine catalogue of 112 pages showing many designs of pleasure crafts which they manufacture. The company are builders of the Truscott vapor marine motors. They completed a specially equipped plant only a year since, but have been obliged to add some new buildings which are just now being brought into use to enable them to keep up with the great increase in their business. They now have four acres covered with buildings, have 600 feet of water frontage, have their own private track 400 feet in length, and have an overhead railway for either loading on cars, handling boats from building to building or putting them in the water for trial. The extent of this business can best be understood by an inspection of the great variety of designs shown in this catalogue.

Samuel Eastman & Co. of East Concord, N. H., have received an order for a large consignment of their patent fire nozzles and holders for Bombay, India.

For the past few days there has been more or less trouble among the employees of the large steel car works of the Pressed Steel Car Company, in Allegheny, Pa. An advance of between 5 and 10 per cent. had been given the men in all departments, but about 150 men working in the punching department refused to accept the advance and remained on strike. The places of these men are being filled as rapidly as possible, but their idleness, in connection with lack of material caused by a shortage of men in one department, resulted in a temporary suspension of part of the works, but the management states it expects to have the whole plant running full by the end of this week. It is stated that the trouble was started and is being kept alive by agitators who do not work in the plant.

The Falcon Bronze Company, Youngstown, Ohio, manufacturers of bronze and brass castings, have secured a contract from the American Tin Plate Company, by the terms of which they are to furnish them brass castings. This concern have been for some time considering the advisability of building an addition to their plant, but as yet have not definitely decided as to the size and other details. However, the securing of the large contract from the American Tin Plate Company will in no wise affect their contemplated improvements, their present capacity being ample to take care of this and other contracts which they have on hand.

A meeting of the Board of Directors of the John Dunlap Company, tinware manufacturers, of Pittsburgh, will be held on May 1, for the purpose of voting for or against an increase of indebtedness of the company.

Taking effect April 1, wages of the employees of the Reese-Hammond Fire Brick Company, at Bolivar, Pa., will be increased from 5 to 20 per cent., depending on the class of labor.

The Shiffler Bridge Company of Pittsburgh are shipping to Monterey, Mexico, this week material for the building of a smelting works at that place. This concern have also received a contract for a steel building to be erected at Chihuahua, Mexico. They are also constructing a steel dam for Venezuela.

Trade Publications.

Automatic Gear Cutters.—F. H. Bultman & Co. of Cleveland, Ohio, describe in a pamphlet the Superior automatic gear cutters and also present data relating to gear cutting. These machines have been on the market about seven years, and have gained for themselves an enduring reputation for accurate work. They are made in various sizes for cutting spur, bevel and worm gears. A special feature on all the machines is their patent safety device, which saves the blanks from being spoiled. The device is positive in its action and so designed that the cutter will absolutely not enter the work unless it is properly spaced. The dividing disk is perfectly accurate and makes one complete revolution to each division, and there cannot be any mistake in dividing so long as the proper change gears are selected. The change gears furnished with all of the Universal machines are 50 in number and will cut all the numbers of teeth from 12 to 100, and nearly all between that and 400.

Feed Water Heaters.—I. B. Davis & Co. of Hartford, Conn., describe the Berryman feed water heater and purifier in a recent catalogue. This appliance has been on the market for nearly a quarter of a century, and is acknowledged to be one of the most perfect devices ever presented for heating water with the use of exhaust or waste steam. It heats feed water for boilers with the highest degree of efficiency with the use of exhaust steam, and it frees the water from all impurities except those which can only be removed by evaporation. Thus the boilers are kept clean and free from scale, the damaging expansion and contraction of the boilers, which results when the feed water enters cold, is prevented, and a great saving is effected in boiler repairs.

Brick Machinery.—Catalogue No. 15 by the Chambers Brothers Company of Philadelphia describes their wide line of brick making machinery and the appliances appertaining to the manufacture of brick. It is stated that the labor required to run one of these machines, largest size, in ordinary material, exclusive of digging the clay, carrying it to the machine and bearing off the bricks, is two men to feed the machine, one man to tend the cut off, sanding device, and one engineer or fireman. Three-quarters of a ton of anthracite coal or of anthracite coal dust, 18 bushels of bituminous coal or 1 cord of wood, with a good engine, will make from 45,000 to 50,000 bricks of Philadelphia size from good clay. From this the cost of converting the clay into green bricks can easily be computed for any locality. The modern brick factory, catering to a large and steady demand for a suitable article, has made it quite common to operate two, four and in some cases six of the largest Chambers machines in one yard and under one management. Such wholesale manufacture has so reduced operating expenses that the present cost of production under such circumstances seems almost incredible when compared with earlier methods when operating only one machine.

By-Product Coke Ovens.—The Semet-Solvay Company of Syracuse describe a series of installations of the Semet-Solvay by-product coke oven in a pamphlet recently issued. The plants include 25 experimental ovens at Syracuse, 25 ovens at Sharon, Pa., 60 ovens at Wheeling, 50 ovens at Dunbar and 120 ovens at Ensley. We observe that the oven is also used for carbonizing waste products, a garbage plant now being in operation at Boston.

Wood Working Machinery.—The Hall & Brown Wood Working Machine Company of St. Louis, Mo., have issued a large pamphlet descriptive of their products. These include circular and band saws, resawing machines, gang ripping machines, molders, planers, surfacers and so on.

The Wellman Plant.—Frank Samuel of Philadelphia has purchased for parties whose identity is not revealed the plant of the Wellman Steel Company at Thurlow, Pa. The works consist of a small Bessemer plant with two 3-ton converters and four moderate sized open hearth furnaces. There is a blast furnace with three Whitewell stoves and a Southwark blowing engine. The property includes 23 acres of land on the Delaware with a pier 375 feet long.

Reports received by State Factory Inspector O'Leary of New York indicate that industrial improvement is making good progress in the Empire State. The report year of the department begins December 1, and for the three months of December, 1898, and January and February, 1899, the records filed show 9600 inspections, of which 373 were found to be new firms in business and 100 were old firms that had resumed business. It was found that 1119 firms had increased the number of their employees to the extent of 18,352 persons.

The Iron and Metal Trades.

Our monthly blast furnace statistics are of special significance because they show a further decline in the active capacity at work. The Coke and Anthracite furnaces running on February 1 were rated at 232,672 tons per week. On March 1 the output was estimated at 223,865 tons per week, a falling off of 8807 tons per week. Furnace stocks at the same time declined 47,000 tons.

The February product throughout the country was far below expectations. Thus in the Pittsburgh district the furnaces which on the basis of their January make were expected to produce in February a little over 63,000 tons per week, actually made little more than 50,000 tons per week. Aside from this accidental reduction, due to climatic conditions, the events of the past two months have pretty thoroughly proven that new capacity cannot be made available over night. That preparations are going on in different parts of the country on an extensive scale is certainly true, but consumers of Iron must reckon with the fact that it takes as many months to get ready as it does weeks by estimates.

American managers deservedly possess a reputation for their ability to rush, but in spite of that fact our furnace capacity does not possess the elasticity for which it is given credit. The present very lucrative prices will bring every old pot into line, but it takes time to accomplish the feat of putting the cripples on their legs.

In the meantime the Pig Iron markets are being swept bare of supplies for longer and longer periods. There have been heavy sales in the Northwest, our Chicago correspondent reporting sales of Foundry Iron aggregating 35,000 to 40,000 tons. It is a noteworthy fact that in spite of our rapid advance the Southern makers have still been selling Iron for export.

Recent advices from Europe indicate that the latest trouble there is the scarcity of Furnace Coke.

Little is heard of late from those who preach moderation as a sacred duty; everybody is too busy harvesting to worry about the weeds in the next crop.

The Steel market is at a standstill. The few who are forced into the market pay what prices the stray seller who can meet deliveries chooses to ask.

The Western Bar mills are said to have practically concluded their plan of consolidation, which is to take in 34 out of the 38 works in the territory west of a north and south line drawn through Pittsburgh. Moore & Schley of New York are to finance the undertaking, which, according to present plans, is to provide about \$1,500,000 for the building of a modern Steel plant on the shore of Lake Erie, probably in the Cleveland district. The capacity of the Western and Southern mills is said to be about 900,000 tons of Bars annually.

The Tube consolidation has not yet reached the point when the underwriting syndicate is ready to accept subscriptions.

The American Steel & Wire Company have strengthened their hold on Raw Material and on Wire Rods by the purchase of the plant of the Shoenberger Steel Company of Pittsburgh, Pa.

Heavy requirements continue to come out in Finished Material of all kinds, and the famine in such lines as Plates continues unabated.

A Comparison of Prices

At date, one week, one month and one year previous.
Advances Over the Previous Month in Heavy Type.

Declines in Italics.

	Mch. 8. 1899	Mch. 1. 1899	Feb. 8. 1899	Mch. 9. 1899
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PIG IRON:

Foundry Pig, No. 2, Standard, Philadelphia.....	13.75	\$13.50	\$12.00	\$10.70
Foundry Pig, No. 2, Southern, Cincinnati.....	<i>13.25</i>	12.50	11.75	9.00
Foundry Pig, No. 2, Local, Chicago.....	14.00	13.00	12.00	10.75
Bessemer Pig, Pittsburgh.....	<i>13.50</i>	13.50	11.40	10.30
Gray Forge, Pittsburgh.....	<i>12.75</i>	12.50	10.75	8.85
Lake Superior Charcoal, Chicago.....	14.50	14.00	12.50	11.50

BILLETS, RAILS, ETC.:

Steel Billets, Pittsburgh.....	23.50	22.00	17.25	15.25
Steel Billets, Philadelphia.....	25.50	24.00	19.50	17.30
Steel Billets, Chicago.....	23.50	23.00	18.50	17.50
Wire Rods, Pittsburgh.....			25.00	22.50
Steel Rails, Heavy, Eastern Mill.....	23.00	23.00	20.00	17.50
Spikes, Tidewater.....	<i>1.55</i>	1.55	1.50	1.50
Splice Bars, Tidewater.....	1.20	1.20	1.15	1.15

OLD MATERIAL:

O. Steel Rails, Chicago.....	9.50	9.00	8.00	8.3
O. Steel Rails, Philadelphia.....	<i>13.25</i>	12.75	10.50	10.50
O. Iron Rails, Chicago.....	16.00	14.50	14.00	12.25
O. Iron Rails, Philadelphia.....	16.00	15.00	14.00	12.50
O. Car Wheels, Chicago.....	15.00	14.50	13.00	11.50
O. Car Wheels, Philadelphia.....	13.50	13.50	10.50	10.50
Heavy Steel Scrap, Chicago.....	9.50	8.00	8.00	7.50

FINISHED IRON AND STEEL:

Refined Iron Bars, Philadelphia.....	1.30	1.25	1.20	1.07 $\frac{1}{4}$
Common Iron Bars, Youngstown.....	1.20	1.15	1.05	0.92 $\frac{1}{4}$
Steel Bars, Tidewater.....	<i>1.35</i>	1.35	1.17 $\frac{1}{2}$	1.10
Steel Bars, Pittsburgh.....	<i>1.25</i>	1.25	1.10	0.92 $\frac{1}{4}$
Tin Plates, Tidewater.....	<i>1.85</i>	1.70	1.50	1.10
Tin Plates, Pittsburgh.....	1.60	1.60	1.40	0.97 $\frac{1}{4}$
Beams, Tidewater.....	<i>1.55</i>	1.55	1.40	1.30
Beams, Pittsburgh.....	<i>1.40</i>	1.40	1.30	1.15
Angles, Tidewater.....	<i>1.40</i>	1.40	1.30	1.15
Angles, Pittsburgh.....	<i>1.30</i>	1.30	1.20	1.00
Skelp, Grooved Iron, Pittsburgh.....	<i>1.40</i>	1.40	1.20	1.05
Skelp, Sheared Iron, Pittsburgh.....	<i>1.50</i>	1.50	1.30	1.10
Sheets, No. 27, Chicago.....	2.30	2.30	2.20	2.05
Sheets, No. 27, Pittsburgh.....		2.10	1.90	1.90
Barb Wire, f.o.b. Pittsburgh.....	<i>2.35</i>	2.35	2.10	1.75
Wire Nails, f.o.b. Pittsburgh.....	<i>1.85</i>	1.85	1.60	1.45
Cut Nails, Mill.....	1.40	1.40	1.30	1.10

METALS:

Copper, New York.....	<i>17.75</i>	17.75	17.75	11.87 $\frac{1}{4}$
Spelter, St. Louis.....	5.80	6.00	5.65	4.00
Lead, New York.....	<i>4.30</i>	4.30	4.57 $\frac{1}{4}$	3.73
Lead, St. Louis.....	<i>4.15</i>	4.20	4.40	3.60
Tin, New York.....	<i>23.85</i>	24.00	24.00	14.25
Antimony, Hallett, New York.....	10.00	10.00	9.75	7.50
Nickel, New York.....	38.00	38.00	38.00	33.00
Tin Plate, Domestic, Bessemer, 100 lbs., New York.....		3.60	3.44	2.90

Chicago. (By Telegraph.)

Office of *The Iron Age*, 805 Fisher Building, CHICAGO, March 8, 1899.

Attempts have been made in some finished products to check the disposition of buyers to place contracts for forward delivery by refusing to receive orders for delivery after July 1. This has, however, led to increased orders for delivery before that time, the buyers presumably preferring to take the material and pay interest on its cost rather than run the risk of finding themselves short in the last half of the year. Other attempts to check the tremendous demand have only resulted in equally persistent efforts to anticipate expected scarcity in the future. Efforts to induce calmness and conservatism seem to aggravate rather than correct the situation. A very great deal of material could be sold if it were to be had. It is stated that the local demand would immediately absorb 50,000 tons of Billets if they could be provided. The great question now asked is, how long will this condition last? Much depends on how accurately merchants and consumers answer this question in shaping their policy for the next six months.

Pig Iron.—The past week has been exceedingly active. Estimates made of the tonnage placed are 35,000 to 40,000 tons. Included in the transactions is a sale of about 15,000 tons to an agricultural interest. The business of the week was divided among the Northern and Southern furnaces, but the Northern producers are credited with taking the greater part. The demand seemed to increase from day to day, and as prices were advanced on successive transactions the desire was great among those who were still in the market. The leading producers were obliged to refuse to quote on a number of inquiries from excellent concerns in order to keep some Iron available for regular customers during the summer. The furnace companies are all refusing to sell beyond December delivery, but in fact very few will sell that far ahead. The buyers of small lots are now getting better attention than those who want large quantities. Our quotations show further advances from 50c. per ton on Southern to \$1 per ton on local Iron. Reports from Cincinnati state that No. 1 Soft has sold there at equal to \$15, Chicago. Good inquiries are on the market for Lake Superior Charcoal, but sellers for

forward delivery are now quite few. We quote for cash as follows:

Lake Superior Charcoal.....	\$14.50 to \$16.00
Local Coke Foundry, No. 1.....	14.50 to 15.00
Local Coke Foundry, No. 2.....	14.00 to 14.50
Local Coke Foundry, No. 3.....	13.50 to 14.00
Local Scotch, No. 1.....	14.50 to 15.00
Ohio Strong Softeners, No. 1.....	15.00 to 15.25
Southern Silvery.....	14.50 to 15.00
Southern Coke, No. 1.....	14.50 to 14.75
Southern Coke, No. 2.....	14.00 to 14.25
Southern Coke, No. 3.....	13.75 to 14.00
Southern Coke, No. 1 Soft.....	14.50 to 14.75
Southern Coke, No. 2 Soft.....	14.00 to 14.25
Foundry Forge.....	to
Gray Forge and Mottled.....	to
Southern Charcoal Softeners.....	to
Alabama and Georgia Car Wheel.....	17.00 to 18.00
Malleable Bessemer.....	to 14.50
Standard Bessemer.....	to 14.50
Spiegel, 20 per cent.....	to 30.00
Jackson County Silvery, according to Sli- con.....	14.50 to 16.00

Bars.—The demand is heavy for both Bar Iron and Soft Steel Bars. Inquiries are being made by telegraph in many cases, showing that consumers are very anxious and fear the delay of the mails in getting the best market price. Advances have been made of \$2 per ton and more during the week, but they have by no means checked the demand. Mill shipments of Common Iron are quoted at 1.30c. to 1.35c., and Soft Steel Bars at 1.40c. to 1.50c., Chicago. The mill price has lately advanced more rapidly than store prices. Hoops are now quoted at 1.55c., base, Chicago, for Bands, with full extras. Jobbers are finding still heavier demand from store and hold small lots at 1.50c. upward, with full Iron extras, for both Iron and Soft Steel Bars. Norway and Swedish Iron is quoted at 3.20c. The Western Bar Iron manufacturers are now holding a meeting in this city, and it is claimed that the consolidation of the mills is a certainty.

Car Material.—Leading railroad companies will purchase this week about 5000 cars and it is expected that some smaller roads will place additional orders. The car builders are still active buyers.

Structural Material.—The market is decidedly lively. One company sold an aggregate of over 25,000 tons during the week. Included in this tonnage are a number of contracts for buildings and bridge work which had been previously referred to in these reports as among inquiries. Smaller transactions are numerous, keeping the sales offices well employed. Mill shipments are quoted as follows, Chicago delivery: Beams and Channels, up to 15 inches, 1.55c. to 1.60c.; 18 to 24 inches, 1.65c. to 1.70c.; Angles, 1.45c. to 1.50c.; Universal Plates, 1.80c.; Tees, 1.60c. to 1.70c. Small lots from store are selling at 2c. upward for Beams and Channels, 15-inch and less; 1.55c. to 1.60c. for Angles, and 1.70c. to 1.75c. for Tees.

Plates.—A large tonnage is wanted for the last half of the year. The local mills have sold 2500 tons for late delivery and could sell a great deal more if disposed to book orders. Buyers are so anxious that they are now placing orders with mills to be shipped at their convenience. They are paying 1.75c., Chicago, on business of this kind. Stiff premiums are being paid on earlier delivery running up to close to 2c., Chicago. Jobbers are now quoting from store 2c. on Tank and 2½c. on Flange Steel. Mill shipments for such deliveries as can be made are quoted as follows, Chicago delivery: Tank Steel, 1.65c. to 1.80c.; Flange, 1.75c. to 1.90c.; Marine, 2c. to 2.10c.; Common Fire Box, 2.25c. to 2.30c.; Best Fire Box, 3c. to 4c.

Sheets.—Heavy inquiries are being received for Sheets, but few mills are now making quotations. Most manufacturers are out of the market, either being sold far ahead or preferring to wait until the situation is clearer. The Sheet mill consolidation is reported to be in the hands of the Moores and likely to be successfully accomplished. Mill shipments of No. 27 Black are quoted at 2.30c. to 2.45c., Chicago, and Galvanized 75 to 75 and 10 per cent. off, with 15c. freight allowances. Small lots of No. 27 Black are quoted at 2.70c.; Wood's, smooth, \$3, base, and Galvanized 75 to 75 and 5 per cent. off.

Merchant Pipe.—The demand has not been checked by the recent advances, but the trade seem to be as hungry as ever. The mills are getting in still worse condition. Three months' delivery is now considered prompt service. Mill shipments continue to be quoted at 60 and six 10's on the full list of Pipe. Merchant Boiler Tubes are quoted in small lots, 1½ to 1¾ inch inclusive, 45 per cent. off for Iron and 50 per cent. off for Steel; 2 to 2½ inch inclusive, 57½ per cent. off for Iron and 62½ per cent. off for Steel; 3-inch and larger, 65 per cent. off for Iron and 67½ per cent. off for Steel, with an extra 5 per cent. for carload lots.

Merchant Steel.—A good demand is reported at advanced prices. A further advance of \$2 per ton has just

been made on previous quotations on Machinery, Tire and Spring Steel. These prices are \$8 per ton over those of last summer. Tool Steel has materially stiffened and the market is now absolutely up to our minimum quotations. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 1.95c. to 2.05c.; Smooth Finished Tire, 1.70c. to 1.80c.; Open Hearth Spring Steel, 1.95c. to 2.05c., base; Toe Calk, 2c. to 2.10c., base; Ordinary Tool Steel, 5.50c. to 7c.; Specials, 10c. upward. Jobbers are quoting small lots from stock at 2.10c. for Tire, 2.30c. for Machinery, 2.40c. for Spring, and 2.30c. for Toe Calk, full extras.

Billets and Rods.—Nominal quotations are \$23.50 on Bessemer Billets, \$26 on Open Hearth Billets, and \$31 on Wire Rods. No Bessemer Billets and Wire Rods can be obtained at any price, however, from the local mills.

Rails and Track Supplies.—About 5000 tons of Standard Sections of Steel Rails were sold last week at \$23 to \$25, according to quality. Light Rails are quoted at \$21 to \$24, according to section, with sales of over 4000 tons. A surprising demand is noted for Light Rails. The local mills have been unable to roll any for stock this winter, which is quite unusual. Track Supplies are quoted as follows: Splice Bars, 1.25c. to 1.35c.; Spikes, 1.65c. to 1.75c.; Track Bolts, with Hexagon Nuts, 2.30c. to 2.35c.; Square Nuts, 2.10c. to 2.15c.; Steel Links and Pins, 1.70c. to 1.75c.; Iron Links and Pins, 1.65c. to 1.75c.

Old Material.—A good demand is noted for everything. Dealers are excited by the eagerness of consumers, often finding that prices are accepted which had been believed to be considerably above the market. The movement is now up to the mills and is not confined to the dealers. Among the sales of the week was 1000 tons of Low Phosphorus Plate Scrap at \$15 gross ton, which would not fetch \$11.50 early in the winter. The holders now ask \$18 for this class of Scrap. Dealers' selling quotations are nominally as follows, per gross ton: Old Iron Rails, \$16 to \$16.50; Old Steel Rails, mixed lengths, \$9.50; selected long lengths, \$10 to \$11; Relaying Rails, \$14 to \$15; Old Car Wheels, \$15; Heavy Melting Steel Scrap, \$9.50; Mixed Steel, \$7.50. The following selling prices are per net ton: No. 1 Railroad Wrought, \$13 to \$13.50; Dealers' Forge, \$11.50; Fish Plates, \$14 to \$14.25; No. 1 Mill, \$8.50; Heavy Cast, \$10.50 to \$11; Stove Plates, \$7.50 to \$8; Iron Car Axles, \$16.50; Horseshoes, \$11; Cast Borings, \$4.75; Steel Axle Turnings, \$8; Iron Axle Turnings, \$8.50; Machine Shop Turnings, \$7 to \$7.25.

Metals.—Copper is unchanged at 18½c. for carload lots of Lake and 17½c. for Western. Spelter also stands as before at 6c. to 6½c. Pig Lead was depressed during the week by offerings from second hands, selling down to 4.05c. and 4.07½c. These figures were attractive to consumers, who bought quite freely to average up their costs, and the market recovered to 4.15c., with more buyers than sellers.

Tin Plate.—The Tin Plate manufacturers have practically withdrawn from the market, as they are only offering to take orders subject to their own ability to deliver and at a price to be based on market conditions when delivery is made. The demand would be lively if the opportunity was open as usual to place business. Jobbers find a heavy trade being thrown on them, but are handling it conservatively and are not making sales in large lots. They quote \$4.35, base, on 100-pound Cokes, and \$6 to \$6.25 on first quality full weight Charcoal.

Jas. O'Donnell, manufacturers' agent, who was burned out on the 14th of February at 10 to 24 West Water street, Chicago, has established himself in Room 504 at 36 La Salle street, Chicago, where he will continue in the same line of business, representing a number of manufacturers of iron and steel products.

Pickands, Brown & Co., sales agents for the Illinois Steel Company's Pig Iron, have removed from the ninth floor of The Rookery, Chicago, to much more desirable quarters on the eleventh floor.

Receivers of the Baltimore & Ohio Southwestern having received permission of the United States Circuit Court at Cincinnati to expend \$3,489,641 for equipment, have made the following contracts: Pressed Steel Car Company and Missouri Car & Foundry Company, 2560 box and coal cars, \$1,357,500; Baldwin Locomotive Works, 45 passenger and freight engines, \$502,500; Carnegie Steel Company, 40,000 tons steel rails, \$754,200; American Continuous Rail Joint Company, \$90,900; Union Bridge Company for nine bridges, \$22,741; ballast required for new rails, \$211,800; second track at certain points and repairing of grades, \$500,000. The consent of 90 per cent. of the company's stock was shown by the receivers when they presented their petition to the Court.

Philadelphia.

Office of *The Iron Age*, Forrest Building, Philadelphia, Pa., March 7, 1899.

As regards the movements in prices it is almost impossible to follow closely or with exactness. Price is not very much of a consideration with some buyers; they need material so badly (or imagine they need it) that somebody has got to take their order, hence the extraordinary advances which have been recently realized. It may be perfectly legitimate, and some of the most conservative people appear to think that \$2 or \$3 more will be paid for Pig Iron before midsummer, and in view of the light stocks and the difficulty in securing material for new furnaces to work on it is not impossible that a considerable rise may yet be in store before supplies can be increased to any extent. The last monthly statement made by *The Iron Age* in regard to furnace output, stocks on hand, &c., seems to have set the trade thinking, and closely followed as it was by the blizzard, the shortage began to make itself felt in a very uncomfortable way. It is indeed somewhat doubtful if things would have been forced as quickly as they have been if we had had normal weather during February. A full week (possibly more than that on an average) was knocked out of that month, as regards mining and transportation, which in turn was immediately felt at mills and furnaces, so that in a few days the trade were brought full up face to face with a serious shortage. This was at once intensified by the anxiety of buyers to protect themselves, and although the outcome would probably have been much the same in the long run even if these influences had not intervened, yet the movement would have been of slower growth and possibly less extreme in its character than the one which is still under way. At the moment it is very hard to say what may be the immediate course of events, except that there are no signs of reaction, but whether further advances will be made, or whether prices will remain for awhile at about to-day's rates, time alone can tell. There is no abatement in the "bull" fever, however, and the greatest scoffers of 60 or 90 days ago are now the most rampant in their ideas in regard to high prices.

Pig Iron.—The market is somewhat more settled than it was a week ago, but prices are higher, how much higher it is pretty hard to say, as all sorts of reports are around, and all sorts of prices claimed. It is safe to say, however, that the average is 25c. to 50c. above last week's figures, although there is great irregularity. Some holders profess their willingness to sell No. 2 X on the basis of \$13.75, seaboard, others say they are getting \$14.30, and in some cases more than that, but in ordinary transactions \$14 at tide is probably a fair quotation. This may all be changed in course of 24 hours, as nobody seems very sure what to do, except to sell as little Iron as possible, and so long as this feeling prevails prices are naturally more or less problematical. There is undoubtedly a shortage of Iron for the present, but whether that will continue through the summer months is another problem. Ordinarily it has been the rule to scout the possibility of any such contingency, except as the result of extremely low prices, but with a \$3 to \$1 advance on what were supposed to be "living prices," there is no scarcity of well informed people who predict a further advance during the next two or three months. The whole question hinges upon whether there is, or whether there will be a scarcity in fact, or whether it is merely a deep rooted idea of something for which immediate provision must be made. If the scarcity bugaboo proves to have been unwarranted, and prices once begin to weaken, the tide will probably be just as strong in its downward course as it has been in its upturn, but it must be conceded that conservative people are disposed to take the ground that there will be a real scarcity for some time to come, and that under the most favorable circumstances it will be well on toward midsummer before much relief can be obtained. Meanwhile the demand is very heavy, and with light offerings prices at seaboard are about as follows: No. 1 X Foundry, \$15 to \$15.50; No. 2 X Foundry, \$13.75 to \$14.50; Plain, \$13.25 to \$13.50; Standard Mill Iron, \$13.25 to \$13.75.

Billets.—Prices are hard to quote with exactness, but from \$25.25 to \$26 is possibly the range. Sales have been made at the former figure, but \$26 is now asked, and as there are some urgent demands, it is likely that next sales will be nearer to the outside than to the inside figure above quoted.

Plates.—Business is more urgent than ever, and for deliveries during this month premiums of \$5 to \$10 per ton are said to be bid. Nominal quotations are 1.90c. for Ordinary Plates, but little or no business has been done, simply because mills cannot guarantee deliveries in anything like reasonable time, consequently buyers either pay a premium or take their chances for better terms later on. For deliveries in 60 to 90 days prices

are about as follows for seaboard or for its equivalent: $\frac{1}{4}$ -inch and thicker, 1.90c. to 1.95c.; Shell, 2.05; Flange, 2.25c.; Fire Box, 2.35c. to 2.45c.

Structural Material.—Conditions are much the same as in the Plate trade—there are quotations and quotation. Nominally prices are the same as last week, but to secure material buyers have to negotiate special terms, which are frequently from one-tenth to two-tenths above nominal rates, which are still given as follows: Angles, 1.43c.; Beams, 15-inch, 1.53c.; Tees, 1.58c.; Zee Bars, 1.57c.; Bulb and Deck Beams, 1.73c.

Bars.—Steel Bars have been advanced and are now quoted 1.45c. to 1.50c., and are in short supply at that. Iron Bars are supposed to be 1.30c. to 1.35c., but as in other departments it depends on circumstances, whether or not the order is wanted. The demand is extraordinary and the advance in material compels the mills to move with the rest of the market. Prices are about as follows for seaboard or equivalent deliveries in carload lots and upward: Ordinary Bars, 1.20c.; Refined Bars, 1.30c. to 1.35c.; Test Bars, 1.40c.; Steel Bars, 1.45c. to 1.50c.

Sheets.—The demand keeps the mills running to their extreme capacity and at full prices. A good deal of business for long delivery is offered, but manufacturers are not disposed to go too far ahead under present conditions. Prices are quoted as follows for best makes (Common Sheets about two-tenths less): No. 10, 1.90c. to 2c.; No. 14, 2.10c. to 2.20c.; No. 16, 2.30c. to 2.40c.; Nos. 18-20, 2.50c. to 2.60c.; Nos. 21-24, 2.40c.; Nos. 26, 27, 2.50c.; No. 28, 2.60c. to 2.70c.

Old Material.—There is quite a scarcity of Old Material, which combined with a great increase in the demand makes prices difficult to quote. Some who are well up to the times have realized handsome prices, others who have been waiting for a chance to realize have been somewhat easier in their terms, consequently a difference of 50c. to \$1 per ton has not been unusual of late. A fair average of to-day's prices for deliveries in buyers' yards would be as follows: Cast Borings, \$9 to \$9.25; Wrought Turnings, \$10 to \$10.25; Machinery Cast, \$10.75 to \$11; Old Car Wheels, \$13.50 to \$14; Heavy Steel Scrap, \$13 to \$13.25; Steel Rails, \$13.25 to \$13.75; Iron Rails, \$16 to \$17; Choice Railway Scrap, \$14.75 to \$15.25; Iron Axles, \$16 to \$17; Steel Axles, \$14.25 to \$15.

Cincinnati. (By Telegraph.)

Office of *The Iron Age*, Fifth and Main streets, CINCINNATI, March 8, 1899.

The pulse of the Pig Iron market has been quite feverish and excitement has been the order for the past week. Large quantities of both Southern and Northern product have been sold for delivery after June throughout the remaining half of the year. There has also been a considerable aggregate tonnage booked for May and June. Every pound to be had for quick delivery is eagerly sought after, and advancing prices do not act as a bar in the pathway of trade. The all important problem of the past weeks appears intensified at this writing. It is not price but delivery which is troublesome. Consumers are showing more excitement, and as prices advance are asking and getting better prices for their own product. Stocks at the furnaces are about gone and shipments are now straight from the hotbed. There is but little difference between the prices which are being quoted in the North and South. Northern furnaces are hardly so closely sold up as the Southern ones, though without exception they are taking advantage of the strength of the conditions and are getting full prices for their product. No one seems to think that the limit in price has yet been reached, though many would like to see the market in a more settled state. Sales of No. 1 Foundry are reported at \$11.50, Birmingham, and No. 2 Foundry has gone to \$11. These figures are a little beyond the actual market, however, and 25c. lower would be a truer basis on which to figure. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1.....	\$13.75 to \$14.25
Southern Coke, No. 2.....	13.25 to 13.75
Southern Coke, No. 3.....	12.75 to 13.25
Southern Coke, No. 1 Soft.....	13.75 to 14.25
Southern Coke, No. 2 Soft.....	13.25 to 13.75
Southern Coke, Gray Forge.....	12.50 to 12.75
Southern Coke, Mottled.....	12.50 to 12.75
Ohio Silvery, No. 1.....	14.50 to 15.00
Ohio Silvery, No. 2.....	14.00 to 14.50
Lake Superior Coke, No. 1.....	14.00 to 14.50
Lake Superior Coke, No. 2.....	13.50 to 14.00

Car Wheel and Malleable Irons.

Standard Southern Car Wheel..... \$15.00 to \$15.75
Lake Superior Car Wheel and Malleable.. 15.00 to 15.75

Plates and Bars.—Mills which are so fortunate as to be able to contract for prompt delivery are in position to dictate prices, and while the market is nominally un-

changed yet sellers are actually in some cases getting more than quotations signify. Mills are complaining that Steel is exceedingly hard to obtain, and this hampers operations considerably. We quote, f.o.b. Cincinnati: Bars, wholesale, 1.35c. to 1.45c., with half extras; Bars, retail, 1.50c. to 1.60c., with full extras; Plates, 2c.; Bar Angles, 1.55c. to 1.60c.; Sheets, No. 27, 2.35c. to 2.40c.; No. 10, 2.10c.; No. 16, 2.25c.

Old Material.—The market is in an excited condition and trading has been active on a higher basis. At this date the situation is strong at the following prices, f.o.b. Cincinnati: No. 1 Wrought Railroad Scrap, \$13 to \$13.50, net; Cast Scrap, \$10, gross; Car Wheels, \$12.50, gross; Iron Axles, \$16.50 to \$17, net; Iron Rails, \$15 to \$15.50; Steel Rails, \$9.50 to \$10.

St. Louis. (By Telegraph.)

Office of *The Iron Age*, 512 Commercial Building, St. Louis, March 8, 1899.

Pig Iron.—The tendency of prices continues upward as the visible supply of Pig Iron diminishes. Plenty of wants are coming to market, but very few of them can be satisfied. Specifications for delivery during the last half of the year are being presented to furnaces and find more agreeable consideration than accorded inquiries for 60-day shipment. The recent arctic weather caused Southern operators no small amount of inconvenience, and at a time when every productive element was pressed to the utmost. There is no indication that more furnaces will come into service soon; on the contrary, it is not unlikely that some now active will be blown out for repairs. More than one stack is approaching that condition which calls for relining, and when its idleness is then enforced a needed source of supply will be cut off. The prices named below show an advance of 25c. per ton above last week's figures, but no assurance goes with them that Iron can more readily be picked up at the increased figures. We quote, f.o.b. cars St. Louis, as follows:

Southern, No. 1 Foundry	to \$14.25
Southern, No. 2 Foundry	to 13.75
Southern, No. 3 Foundry	to 13.25
No. 1 Soft	to 14.25
No. 2 Soft	to 13.75
Gray Forge	to 12.75
Mottled	to 12.25

Bar Iron.—The unprecedented volume of business finds daily confirmation in attempts to place orders. A case in point may be cited of a buyer who exercised his heretofore good judgment several months ago and bought enough Bar Iron to carry him to July. To-day he comes to market with immediate needs and the confession "It beats me." The market is strong, as shown by the point blank refusal of a mill to accept an order for a good round lot at a cut of but 5c. under to-day's price. An advance of \$1 per ton is noted and no great readiness to sell even at 1.30c. in mill carload lots and half extras, f.o.b. St. Louis. Jobbers are quoting 1.40c. and full extras from St. Louis.

Rails and Track Supplies.—No unusual movement of new Rails is noted in this market. Track supplies are showing advanced prices, and we quote Supply Bars 1.35c. to 1.40c.; Track Bolts, with Square Nuts, 2c.; with Hexagon Nuts, 2.20c.; Iron or Steel Links and Pins, 1.65c.; Spikes, 1.70c. to 1.80c.

Old Material.—Old Steel Rails of long lengths are held at \$11 and Old Iron Rails have been reported as bought at \$15. No. 1 Railroad Wrought Scrap is stated to be worth \$13, and No. 2 Track Scrap \$11.50 per net ton. Prices for Old Material vary greatly, and how little to pay and how much to get for given lots must be left to individual disposition.

Sheets.—There is a good trade to be had in Black Sheets and the quotation on No. 27 Common Black is placed at 2.45c. to 2.50c., f.o.b. East St. Louis. This considerable advance in one week does not bring out freer shipments and a buyer is forced to apply new specifications on present contracts. While the movement of Galvanized Iron in greater shipment for the moment is somewhat sluggish, the mills hold stiffly to a discount of 75 and 5 per cent., with the usual small allowance for freight applying only to carload purchases.

Pig Lead.—Better tone has developed in Pig Lead, and it is easily salable at 4.15c. There is more of a disposition to buy, but it may be said confidently that no large block could be had at the market prices. From the present outlook higher figures will now be the rule, as inquiries show consumers' actual needs. The price obtained for Lead Ore at Joplin is \$25 per ton, which shows a drop of \$1 from last price named.

Spelter.—The demand is rather moderate, although some car lot people are feeling the market. Smelters

are sold up and averse to taking further orders or encouraging much inquiry. Spelter is quotable at 6c. to 6.05c., with scanty offerings. The Missouri Association inaugurated a new policy upon which the sales of Zinc Ore shall be made. In the protection of their interests the Joplin Association felt called upon to fix the price of Ore upon St. Louis market price of Spelter. Sixty per cent. Ore has been fixed at \$42 per ton so long as the price of Spelter in St. Louis remains at 6c., and this basing has met with support by the Ore producers.

Birmingham.

BIRMINGHAM, ALA., March 6, 1899

The market the past week was a surprise. The preceding week a prominent official of one interest reported sales as one-third or less of output. The same interest the past week booked orders for a month's output and at prices showing a material advance. One prominently identified with Iron said: "We are puzzled. We can say we have sold all we cared to sell and more than we desired. We have replied to inquiries for Iron and quoted prices that we thought prohibitive, because we did not desire to sell freely, and nearly every price named was promptly accepted. We are therefore in the paradoxical position of not desiring to sell freely and yet being free sellers." Another said: "All classes of buyers, big and little, are biting at prices named. Some who declined to buy the preceding week at lower figures were the leaders the past week at advanced prices, which is very good evidence of their inability to buy elsewhere at more favorable rates. The one notable feature of the buying is that it is all from sources which indicates that purchases are for melting. There is nothing in them savoring of speculation."

There is a disposition to say as little of prices as possible, and it has been very difficult to obtain dependable figures. Those given herewith are practically correct. One must remember that on such a market irregularity in prices prevails to a greater or less extent. Gray Forge is \$9.50 and might possibly be shaded to \$9.25. Foundry Forge is the same price. No. 3 Foundry, \$10 to \$10.25; No. 2 Soft, \$10.75 and above; No. 2 Foundry, \$10.75 to \$11. It is safe to say that all the grades have sold at the inside quotations, and it would now be difficult to buy at less than outside quotations. The sales in quantity indicate a fairly active demand, while in reality it is a keen demand. The accepted orders in many cases were the scaled down wants of importunate buyers. The advance during the week will average 75c. per ton and there is a feeling that it is not over yet. A portion of the demand filled was for export, but compared with the domestic trade that was small. In warrants no transactions were reported. Early in the week some were offered at 10 shillings for No. 2 Foundry, but not sold.

The Vanderbilt Furnace, which has been idle for several years, and sold a short time ago by decree of court, was secured by local parties, who have definitely decided to rehabilitate it and put it in blast. It may be making Iron the latter part of the second quarter. But its capacity is given by Ironmen at 100 tons or less, so it can't cut much of a figure.

The Consolidated Electric Company have been compelled by increased demands to enlarge their capacity and have given the contract for two additional boilers of 125 horse-power each to the Birmingham Boiler Works. The Alabama Brewing Company have found it necessary to add to their power and will put in a set of Heine boilers. The Rod mill find it expedient to build a foundry in connection with their plant to make their castings, and operations are in progress to that end. Two large business houses in the heart of the business part of the city have been commenced. The contract for St. Vincent's Hospital has been let and preparatory operations commenced, while bids are asked for the erection of the new Hillman Hospital, to be located in the heart of the city. Besides this, the systems of street railroads will be extended this summer to such an extent that Birmingham will be the hub from which will radiate her railways to every settlement within reach. All this indicates for the building trades and their connections a season of pronounced activity.

The rolling mills combination or trust has been completed, so report says from sources that are usually reliable. The terms are said to be agreed upon, but the successful financing of the trust has not yet been announced. It is understood that both of our rolling mills are parties to the compact. In connection with this is information of the culmination of another enterprise of large proportions to be located here, in which Eastern capital is largely interested. But just what it is has not yet leaked out and everything said of it here is only surmise as yet.

The rolling mills advanced prices again on finished product the past week. Buyers figure the total of these advances so far at 50c., say \$10 per ton. The trade takes the advance as a matter of course and there is no diminution of business because of it. The mills continue to be

loaded with orders and all departments are in a rush, with some almost constantly behind in promptly supplying the demand. And the same can be said of the Steel mill, whose product is in constant demand.

The Iron output was diminished the past week by one of the Pioneer Company furnaces being thrown out of blast. The lining caved in. Of course it will have to be relined, and this takes time. Operations in coal mining continue fully up to all facilities, with every indication of a continuous activity. There is much prospecting going on concerning mineral and coal lands, but no transactions of consequence have been concluded. There is a disposition now to divert effort to secure industries into new channels under the belief that the impetus already given to Iron industries will fill that branch in the fullness of time. The idea is now to secure large plants in cotton industries and thus diversify the industries and make our locality free from a sole dependence on Iron and Coal. The minor industries continue the same favorable reports heretofore recorded. All along the line there was a uniform report of new business secured and of new work for estimates. In not a single case was a poor mouth put up as to amount of work offering.

As evidence of the avidity with which buyers are picking up Iron without too much particularity as to grade is the sale of 1000 tons from the Sheffield district that was regarded almost as a Scrap pile. But it was Iron. It was "off color," but the scarcity of grades and the off price mitigated its condition.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, Pittsburgh, March 8, 1899.

(By Telegraph.)

Pig Iron.—The Price Committee of the Bessemer furnaces are meeting in Cleveland to-day to fix the price of Bessemer Pig for the third quarter, and perhaps for the fourth quarter, of the year. It is generally expected an advance will be made, but how much is not known. The furnacemen state they are inclined to be conservative and not put the price too high. It is intimated that \$14, Valley furnace, for the third quarter may be the figure. There is not much doing in Pig Iron, inquiries being nearly altogether for small lots. The last sale of any consequence was 10,000 tons to a local interest at \$12.50, Valley. Forge Irons are very scarce and can hardly be had. Valley furnaces quote up to \$12.50, and the market in Pittsburgh is all of \$12.75 up to \$13. Foundry Iron is away up in price, and prompt Iron can hardly be had. The whole market is feverish and excited, and still higher prices are predicted. We quote Bessemer at \$13 to \$13.50, Valley, for delivery up to July; Gray Forge, \$12.50 to \$12.75; No. 1 Foundry, \$14 to \$14.25; No. 2 Foundry, \$13.25 to \$13.50; Gray Forge, \$12.75 to \$13; Bessemer, \$13.50 to \$14, all f.o.b. Pittsburgh. It is reported that Bessemer Iron for the third quarter has sold at \$13.20, Valley furnace. We note a sale of 300 tons of No. 2 Foundry at \$13.15, Pittsburgh, and a sale of 500 tons of No. 1 Foundry at \$14.25, Valley furnace.

Steel.—The top price paid for Billets so far is \$24, a local mill reporting a sale of 200 tons at that price. There is not much inquiry for Steel, consumers being covered. Where a buyer comes into the market and has to buy Billets he must pay whatever price the seller chooses to name. There is very little Steel to be had, and in the present condition of the market it is useless to make quotations. The policy of the National Steel Company as regards sales and prices of Billets and Sheet Bars has not been defined.

Muck Bars.—Prices have further advanced, and we quote best grades of Muck Bar at \$22.75 to \$23, Pittsburgh.

(By Mail.)

The week past in the Iron trade has been without special feature. The extraordinary demand for materials continues, and prices on several lines of product have again advanced. It is believed, however, that the limit has pretty nearly been reached, and there is a disposition on the part of the conservative element to hold prices where they are. Whether this can be done in the face of the greatest demand ever known is questionable. It is realized, however, that the present high prices on Pig Iron,

Billets and all kinds of Finished Material cannot be continued indefinitely, but with tonnage already entered and the heavy demand it is probable present values can be sustained up to the close of the year at least. Industrial stocks have been heavy in the past few days, and it looks as though the limit in consolidations of various trades had about been reached. The public are getting somewhat chary of industrial stocks and are showing a disposition to hold aloof. Bank statements for the past week have not been quite as favorable. The principal event of the week has been the purchase of the entire plant of the Shoenberger Steel Company in Pittsburgh by the American Steel & Wire Company. By the acquisition of this plant the American Steel & Wire Company have secured a fairly modern Steel plant, two small blast furnaces with an aggregate daily capacity of close to 400 tons, a basic open hearth plant, horseshoe factory and the new Rod mill, which was the principal thing desired. All the details have not been arranged, but the actual sale of the plant has been consummated. The American Steel & Wire Company by this recent purchase are absolute masters of the Rod market, and are in position to supply their mills in the Pittsburgh district with all the Steel they can use. It is understood the sale was made on the basis of about three to one. Interest attaches to the meeting of the Price Committee of the Bessemer Furnace Association to be held in Cleveland on Wednesday, March 8. The fixing of a price on Bessemer Iron for the third quarter and also for second half of the year will be considered. It is likely the price for third quarter will be put at either \$13 or \$13.50. The furnacemen say that they want to be conservative and not put up prices too high to shut off demand. Billets for spot shipment have sold at \$24, Pittsburgh, but this is not a criterion of the general market. In Finished Material prices are practically unchanged, with the exception of Sheets, which are a dollar or two a ton higher. Spelter has gone off considerably.

Ferromanganese.—We quote in lots of 100 tons and over at \$55 and carload lots at \$60, maker's mill. There is considerable demand.

Plates.—The situation in Plates is simply that the mills are filled with business up to July, and a buyer who would come into the market for Plates for delivery within 30 or 60 days would probably have to pay up to 1.75c., Pittsburgh, for Tank. Several local mills have recently quoted this figure for delivery in two to four weeks. The leading mill is understood not to be promising anything this side of August. We quote Tank $1\frac{1}{4}$ inch and heavier 1.60c. to 1.75c., the lowest price being for delivery in three to four months; Flange, 1.80c.; Marine, 1.90c.; Ordinary Fire Box, 2c.; Locomotive Fire Box, 2.75c. We wish to emphasize the fact that where Plates for prompt delivery are wanted mills can obtain our higher quotations.

Structural Material.—Among large jobs in the market is the Quebec bridge at Quebec, on which the Carnegie Steel Company of Pittsburgh are bidding. Considerable tonnage is involved in this work. A good many large jobs are in sight and the aggregate tonnage being placed with the mills is large. Prices are firm, but there are no prospects of an immediate advance. We quote as follows: Beams and Channels, 15-inch and under, 1.40c.; 18, 20 and 24 inch, 1.50c.; Angles, 1.30c.; Zees, 1.40c.; Tees, 1.45c., all f.o.b. cars Pittsburgh.

Rails.—There is nothing of interest to report. The mills are full of tonnage, having orders enough to run them full up to July or August. We quote: Steel Rails, Standard Sections, at \$22, Pittsburgh; Light Sections, 25 to 40 lbs., \$22 to \$24, depending on the order and deliveries required; 16 to 20 lb. Rails, \$25, all f.o.b. Pittsburgh.

Bars.—Prices on both Iron and Steel Bars are higher, a leading mill quoting 1.35c. for Steel. Prompt Bars can hardly be had at any price, local and Valley mills being filled up for the next three or four months. Demand continues heavy and still higher prices are likely. We quote Steel Bars at 1.25c. to 1.35c., our higher price being for early delivery. Iron Bars are higher, and we quote at 1.20c. to 1.25c., maker's mill. Some sellers are quoting higher prices.

Spelter.—The market is considerably easier and prime Western grades of Spelter are offered this morning at 6.06c., Pittsburgh. It is predicted that prices will go still lower.

Sheets.—The market is steadily advancing and we can report sales of 500 to 600 tons of No. 28 at 2.25c., Pittsburgh. We hear of higher prices being quoted, but these are for Sheets for prompt delivery. There is nothing new to report in the matter of the consolidation of the Sheet mills, but we are advised that the matter is still under way. Prices on Galvanized Sheets are higher and the mills are practically filled up to July 1. We quote No. 27 Black Sheets, box annealed, smooth finish, 2.20c. to 2.25c.; No. 28, 2.25c. to 2.30c., f.o.b. maker's mill. The minimum of the market on Galvanized Sheets in large lots is 75 per cent. off, and on small lots higher prices are quoted.

Merchant Steel.—There is a heavy demand and the mills are all filled up for the next two or three months. Prompt material can hardly be had and mills are held back considerably on account of inability to get Steel as fast as needed. Prices are exceedingly firm and another advance before long is predicted. We quote: Tire Steel, 3-16 x $\frac{3}{4}$ inch and heavier, 1.40c. to 1.50c.; Toe Calk, 1.60c., base; Open Hearth Plow Slabs, 3-16 inch and heavier, under 4 inches wide, 1.50c.; Open Hearth Plow Slabs, 3-16-inch and heavier, over 4 inches wide, 1.65c.; Spring Steel, common, 1.50c.; Open Hearth, 1.75c.; Crucible analysis, 2.50c.; Genuine Crucible, 3.50c.; Machinery Steel, Open Hearth, 1.60c., base; Cant Hook Steel, Open Hearth, 3c.; Cant Hook Steel, Crucible, 3.75c.; Horseshoe Steel, 1.60c.; Lay Steel, rolled, 3c.; Lay Steel, hammered, 3.75c.; Tool Steel, ordinary grades, 5.50c. to 7c.; Tool Steel, best grades, 9c. and upward. These prices are for carload lots, or where a carload is made up of assorted Steels covering the above.

Iron and Steel Skelp.—The situation in the Skelp trade is unsatisfactory for the reason that the mills are filled up and are not making deliveries on material under contract. We made a material advance in quotations on Sheared Steel Skelp. We quote Grooved Steel Skelp at 1.20c. to 1.25c.; Sheared Steel Skelp, 1.50c. to 1.60c.; Grooved Iron Skelp, 1.40c. to 1.45c.; Sheared Iron Skelp, 1.50c. to 1.60c., all four months or 2 per cent. off for cash thirty days, f.o.b. cars Pittsburgh. Where Skelp for prompt delivery is wanted mills might get higher prices than are quoted above.

Pipes and Tubes.—Work is still being pushed on the scheme to take over the Pipe mills into the National Tube Company, but the project is not as far advanced as reports in the daily press would indicate. The eventual consolidation of the mills is predicted by those who are in a position to know what is going on. There is nothing of interest to report in the Pipe trade this week. Demand continues abnormally heavy and the Pipe mills have about all the tonnage on their books they can get out in the next two or three months. Prices on everything are exceedingly firm. We quote Butt and Lap Weld, Black and Galvanized Pipe at 60 per cent. off with six 10's additional for less than carload lots, f.o.b. maker's mill, and an extra 5 per cent. in carload lots delivered in free districts. We quote Screw and Socket Joint Casing at 52 $\frac{1}{2}$ and 10 per cent.; Inserted Joint, 52 $\frac{1}{2}$ per cent., with an extra 5 per cent. to dealers. We quote Boiler Tubes as follows: 1 $\frac{1}{4}$ to 1 $\frac{1}{2}$ inch, 50 per cent. off list; 1 $\frac{3}{4}$ to 2 $\frac{1}{2}$ inch Iron, 60 per cent.; Steel, 65 per cent.; 2 $\frac{1}{4}$ to 5 inch Iron, 65 per cent.; Steel, 67 $\frac{1}{2}$ per cent., with an extra 5 per cent. to dealers.

Connellsville Coke.—The demand for Furnace and Foundry Coke is enormous, but there is still the old trouble of shortage in car supply and a good deal of dissatisfaction among shippers on this account. In the Connellsburg region last week 16,031 ovens were active and only 2612 idle, the production being 168,679 tons. Prices are exceedingly firm and one leading Connellsburg Coke operator is understood to have advanced prices on Foundry Coke 15c. a ton. We quote Furnace Coke at \$1.60 and Foundry Coke at \$2 to \$2.30 in tons of 2000 lbs. at oven. It is understood that some contracts for Furnace Coke for second half of the year have already been entered and at higher prices than were paid for first half.

Cleveland.

CLEVELAND, OHIO, March 7, 1899.

Iron Ore.—The advance in the prices of everything from Pig Iron to the finished product would immediately extend to Iron Ore were there any considerable quantity on the market. Outside estimates by sales agents place the aggregate sales of ore for the season of 1899 at approximately 15,000,000 tons, of which possibly 11,000,000 tons have been covered in contracts for lake transportation. There is no doubt, however, that were it possible to mine 17,000,000 or 18,000,000 tons it could be readily disposed of, for the reason that while sales agents have endeavored to look after the interests of their regular customers and have succeeded in a considerable degree, new interests have been coming into the market, while in some cases furnacemen have discovered, or have at least experienced the fear, that their original estimate of requirements will not prove adequate. One feature of the situation is found in the avidity with which all grades of Ore are selling. In some cases poor grades of ore for which there is ordinarily no market are selling at good prices, and there is no doubt that if it is found possible to get out any more ore than has already been contracted for it will sell readily at a price considerably in advance of that fixed by the association. The whole situation is dependent, in a word, on the quantity of ore which can be mined, but despite the fact that considerable new labor has of late been secured in the mining region it is doubt-

ful if this will be in excess of 15,000,000 or possibly 16,000,000 tons. Some fears have been expressed in Cleveland during the past week as to the ability of the Ore roads to handle the output from mines to dock, largely because of reports to the effect that their equipment has not been increased over last season, but the men in the best position to know assert that these fears are unfounded. The lake transportation situation continues to grow in strength, with a consequent intensified dissatisfaction on the part of some vesselmen who have tied up their vessels on season contracts at 60c. The firm of Pickands, Mather & Co. of Cleveland have secured several vessels on season contracts at 65c., and while some shippers have made the contention that this is without significance in view of the fact that the vessels chartered are controlled by interests affiliated with the firm mentioned, there is no doubt that any boats offered at 65c. in the general market would be quickly taken. The indications are, however, that the vessels not as yet held under contract will not close for a season agreement unless the rate should advance to the neighborhood of 70c., for the reason that unless their owners secure approximately that figure they will operate on a loss if engaged in the ore carrying exclusively, while otherwise they may make up the average by carrying grain at the opening and close of the season. In opposition to this stand, however, is that of some of the Ore shippers, who claim that by reason of the limited supply of labor in the mining region the 1899 output, with the exception of Mesaba, will not be of sufficient magnitude to warrant excessive freight rates. There is also a class of the vesselmen who support this theory, but from a different standpoint. They take the stand that despite the probability of an unusual business in Coal, grain and lumber a boom in Ore rates would be deplorable from the vessel owner's standpoint, inasmuch as a repetition of the conditions of 1895 would be reasonably sure to induce the large Iron and Steel interests to go into the business of building vessels on their own account. The meeting of the vesselmen and grain shippers at Buffalo the latter part of this week to consider the correction of certain abuses in the grain carrying industry is not likely to have any appreciable effect on the Iron Ore situation unless a disagreement should throw an additional number of vessels on the market. Meanwhile no developments are reported in the proposition for night work on the docks. The Carnegie Company announce that their extensive new dock at Conneaut will assuredly be ready by the opening of navigation and will probably increase the capacity 1,000,000 tons on the season, the amount of ore handled there last season approximating 1,400,000 tons.

Pig Iron.—Foundry Irons are in good demand, especially for immediate delivery among the smaller concerns. While the market is nominally \$12 to \$12.50, Valley, for No. 2, there are many instances, governed largely by conditions, where sellers are able to secure considerably more. The last transactions in Bessemer were at \$12.50, Valley furnace, and while the situation is in general unchanged there is no doubt that parties having Bessemer could get a higher figure. No transactions of moment have been reported during the week.

Finished Material.—The inquiry for all grades of Structural Material has been lively during the past week. The Carnegie Company have secured two Cleveland contracts aggregating 1500 tons and have inquiry on others of duplicate amount. Sellers are making a quotation of 1.35c. on Bar Iron, and for No. 27 Black Sheets out of stock a quotation of 2.80c. is made. The Otis Steel Company have made quotations of 1.80c. on small orders for Tank and 1.90c. for Flange. The impression which has gone abroad, to the effect that no Plates are obtainable for immediate delivery even in small consignments, seems to be erroneous, as several mills of limited capacity are now devoting themselves to Tank quality. The Cleveland Steel Company are one of these and are to-day promising to ship orders just received inside of four weeks. Sales of Bessemer heavy Tank for this delivery have been made at various prices ranging from 1.95c. to 2.50c., f.o.b. at mill. The most ominous feature of the outlook in Finished Material appears to be the shortage of cars. At the Homestead Steel Works one day recently the requisition was 100 cars in excess of what the railroad was able to furnish, and predictions are now freely made that the roads will not be able to supply cars for more than 75 per cent. of the business offered this season.

Old Material.—Old Material men still report an inability to supply demands and are to-day making quotations as follows: Steel Melting Stock, \$13; No. 1 Wrought, \$14; No. 1 Cast, \$12; Iron Rails, \$16; Car Wheels, \$15; Cast Borings, \$6, and Turnings, \$7.

The Rock Island Railroad Company announce that in order to fight the car builders' combine they will at once erect a large building at their plant at Valley Junction, a suburb of Des Moines, Iowa, and equip it for making their own cars.

The New York Machinery Market.

Office of *The Iron Age*, 232-238 William street, {
NEW YORK, March 8, 1899.

Last week was one of increased activity in every line in the machinery district. Feelings of buoyancy were distinctly manifest among the leaders in the trade. Purchasers and prospective purchasers of machinery are now coming to the sellers. It was not many months ago when the conditions were just the reverse and machinery merchants were glad to send their representatives chasing up any kind of a tip that looked as though there might be an order at the end of it. Now the sellers are in a stronger position and are writing pretty warm letters to their representative factories, hurrying along deliveries which are weeks overdue. Purchasers of machinery are beginning to realize the really stiff position with which the builders are meeting in securing materials. Quotations are limited to very few days' duration, and are subject to change without notice. Prices are naturally under these conditions rather firm. We hear that a large planer company in Worcester have notified the trade of an advance in price.

The Westinghouse Machine Company have just placed orders for \$250,000 worth of machine tools for the addition to their plant which is in course of construction at East Pittsburgh. Between 130 and 140 large tools were ordered. They were divided principally between the Niles Tool Works Company, Manning, Maxwell & Moore, Bement, Miles & Co., William Sellers & Co., the Pond Machine Tool Company and the E. P. Bullard Company.

The stockholders of the Westinghouse Company have voted \$1,500,000 to pay for the improvements which are being made on the plant. This makes the capital stock of the company \$3,000,000. The company will equip the shop for handling the largest types of engine work. Blowing, reversing and steam engines will be built up to 10,000 horse-power each, and in fact 15,000 horse-power engines can be handled if desired. In consequence of the enormity of the work which the company expect to turn out the equipment will consist of some of the largest tools built. A Bement-Miles lathe of 12-foot swing will have a bed 45 feet long; a special machine will be furnished by William Sellers & Co. for finishing 30-foot fly wheels horizontally, and a Pond planer, 14 x 40 feet, will be included in the installation. The Westinghouse Company, it will be recalled, received the contract for the entire equipment of the Third Avenue (New York) Railroad Company electrical equipment. This work includes 18 engines rated at 7500 horse-power each. These engines can be driven to 10,000 horse-power if necessary. We understand that this company have sublet the gear cutting to R. D. Nuttall & Co. of Allegheny, Pa., and understand also that Mr. Estep of the Nuttall Company has been in New York purchasing gear cutting and other machinery to enable them to cope with the contract without disturbing their regular gear cutting work. It is said that Mr. Estep purchased several large automatic gear cutting machines from Gould & Eberhardt of Newark, N. J.

The Underwood Typewriter Mfg. Company of Bayonne, N. J., are doubling the capacity of their plant. For this purpose they are purchasing a considerable amount of machine tools. We are informed that they have purchased some 25 Cincinnati milling machines from the Prentiss Tool & Supply Company of this city. Mr. Edgar is purchasing agent for the company.

E. W. Irwin, who resigned recently as manager of the New York branch of the Pratt & Whitney Company, has opened temporary offices at 120 Liberty street, Beard Building, where he is conducting the New York business for various machine tool houses.

There is talk in the street about the high speed engine builders trying to get together. The heads of several representative concerns have been seen in consultation at times, and this tended toward strengthening the rumor. High speed engine prices are certainly in pretty bad shape, but the combine scheme has been tried before in this line and it resulted very unsatisfactorily.

There has also been some talk about a combination of the large blower manufacturers.

An order was cabled to this country from Yokohama, Japan, for about 20,000 tons of cast iron water pipe. Since the receipt of this message storms in the East have held up the cable and no confirmation has been received. The company who have received the order do not wish to be mentioned until a confirmation has been received. The award was made through the Japan-American Commercial & Industrial Association, Times Building, New York.

Schuchardt & Schutte, who are probably the largest importers of American machine tools in Europe, will open an office in New York. This company have warehouses and offices in Berlin, Vienna and Brussels, and

represent in Germany, Austria and Belgium many of the largest American machine houses. The New York office will be operated for the purpose of facilitating their banking and general shipping connections, and it is said will not in any wise change the position of their American connections as far as our manufacturers are concerned. We understand that a representative of the company is now en route to this country.

E. H. Hargrave, president of the Cincinnati Tool Company, has just sailed on a six months' business tour, most of which will take in South American points. Mr. Hargrave will go direct to Buenos Ayres and from there to Rio Janeiro and other South American points. He will also cross to London.

Several representatives of the Link-Belt Engineering Company of Philadelphia have sailed for a business trip through Cuba and Porto Rico.

E. P. Bullard, president of the E. P. Bullard Company, Bridgeport, Conn., has returned from a five months' trip to England and the Continent.

Construction Notes.

A contract has been awarded to the Birmingham Machine & Foundry Company of Birmingham, Ala., for a 1500 horse-power engine to be erected in the new rod mill at Ensley City, Ala. A contract for a 700 horse-power engine was also given to the same concern for the nail department of the same plant.

The Merrimack Mfg. Company of Lowell, Mass., recently incorporated with a capital of \$2,500,000, announce that they have just completed arrangements for the erection of a cotton mill at Huntsville, Ala. The mill is to be of 200,000 spindles capacity. The Merrimack Mfg. Company now operate a plant at Lowell, and the new plant will be an improved duplicate of it. The plant will include machine shops, bleachery, printing mill and dye house. The construction of the plant will be commenced within the next few weeks.

It is reported that Superintendent of Machinery John Playton of the Atchison, Topeka & Santa Fe Railroad is looking up a site for the erection of a system of new machine and repair shops. The estimated cost of the shops is \$200,000.

We are informed by the Du Bois Iron Works that they have just completed the erection of a large new machine shop. The company will henceforth be in the market for general machine work. This company have for some time figured in the trade as manufacturers of water tube boilers, mining, tanning and saw mill machinery. John E. Du Bois is proprietor, J. H. McEwen superintendent, and William Osborne purchasing agent.

Work has been started on a new factory building for the Case, McConnell & Cackin Company at Owensboro, Ky. This company are new, paid in capital said to be \$20,000. The corporation will build grain, milling, distilling and hydraulic machinery, boilers and motors. The incorporators are J. M. Case of Cincinnati, A. A. McConnell and H. E. Cackin of Alvordton. Mr. Case owns half of the stock.

It is reported that considerable new machinery is being installed by the American Axe & Tool Company of East Douglass, Mass.

Bids are being asked by A. L. Foote of the Newark Light, Heat & Power Company of Newark, N. Y., for a \$35,000 electric light station.

An addition is being built to the foundry of the Kelly & Jones Company, Greensburg, Pa. It will be 165x60 feet.

The Michigan Portland Cement Company are rushing work on their new addition, which is building at Coldwater, Mich. An entire new plant is also to be built at Quincy, Mich.

Advices from Chattanooga state that the Roane Iron Company will build an iron furnace at Rockwood, Tenn. It is to cost \$200,000 and have a capacity of 150 tons daily.

It is stated that the B. & O. S. W. Railroad anticipates building an \$8000 addition to its boiler shop at Chillicothe, Ohio.

E. H. Dyer & Co. of Cleveland are reported to have received the contract for the erection of a 400-ton beet sugar plant at Benton Harbor, Mich. The plant is to cost \$250,000. This concern are also said to have contracted with the Colorado Sugar Mfg. Company for the erection of a fire proof beet sugar factory. This plant is to be built at Grand Junction, Col., and it is expected to handle 40,000 tons of beets the first year. Work must be completed September 15 of this year.

The Rockaway Electric Railway Company have purchased ground at Jamaica, L. I., for the purpose, it is said, of erecting a power station.

The contract for building the Annapolis ice factory is said to have been awarded to F. J. McCloskey of Philadelphia. The New York Mfg. Company will furnish the machinery.

The contract for the water works and sewerage system for Clayton, N. Y., is said to have been awarded to A. F. Nims of Philadelphia. The installation will consist of Babcock & Wilcox boilers and Deane pumps.

The Holly Mfg. Company, Lockport, N. Y., received the order for the two 8,000,000-gallon pumping engines for the Dubuque Water Company of Dubuque, Iowa.

The Committee on Water Works, Salem, Mass., has reported to the Council that 40 miles of iron pipe will be needed. Estimated cost, \$800,000.

April 1 is named as the date set for the asking of bids for furnishing materials for the new water works for West Bay City, Mich. The work includes one 5,000,000-gallon pump, 4000 feet of 48-inch riveted steel water pipe and about 7600 feet of 16-inch to 30-inch pipe. The City Engineer is J. H. Blomshield.

Reports from Milwaukee state that plans are under consideration for the erection of a large addition to the plant of the E. P. Allis Company. The addition under consideration is 600 feet long by about 150 feet wide. It will be equipped for the manufacture of the heavier machinery for which the company have many large orders at present. It will necessitate the installation of numerous large tools and traveling cranes.

The directors of the Dietrich-Harvey Machine Company of Baltimore have decided to enlarge the works, and will begin at once the erection of a workshop. The proposed improvement is said to be the beginning of a general enlargement of the works, which will be carried on a large scale.

H. G. Morse, ex-president of the Edge Moor Iron Works, who has interested himself in the establishment of a large shipyard in Baltimore, was in Pittsburgh last week getting estimates on structural material and machinery. It is also stated that the new company have been making overtures for the purchase of the Sparrow's Point shipyard of the Maryland Steel Company. The enterprise is said to be backed by New York and Baltimore capitalists, among them John K. Cowan, president of the Baltimore & Ohio Railroad, and President Harlan of the Harlan & Hollingsworth shipyards of Wilmington. It is stated that \$5,000,000 capital has already been pledged.

The Depew Mfg. Company will build a factory at Depew, N. Y., for manufacturing mowing machines and other farm implements. Architects Loverin & Whelan of Buffalo, N. Y., have made the plans, which call for a building of wood and iron 150 x 40 feet.

The Wilmington Malleable Iron Company are constructing an addition to their plant at Taylor and Buttonwood streets, Wilmington, Del.

The Structural Iron Company of Baltimore, Md., are expending about \$40,000 in an addition to their plant. Jules W. Leroux is president and general manager. A main machine shop will be erected at a cost of \$20,000; a power plant, \$5000; a foundry, \$6000, and \$10,000 worth of additional machinery will be purchased.

The John F. Wiessner & Sons Brewery Company of Baltimore will erect a large addition to their plant.

The 250 horse-power engine of the municipal lighting plant of Taunton, Mass., which was damaged by the breaking of a belt, will be replaced by a new one.

Alexander Morton & Co. of Darvel, Scotland, one of the great textile manufacturing concerns of Europe, are to build a great factory at Niagara Falls, using electric power from the cataract to operate the mills.

An order for six large blowing engines was awarded to the Southwark Foundry & Machine Company of Philadelphia by the Carnegie Steel Company, Limited. The contract price is said to be \$250,000. Each engine will have a capacity of 40,000 cubic feet per minute.

The Bass Foundry & Machine Company of Fort Wayne, Ind., and 141 Broadway, New York, received an order from the American Oak Leather Company of Cincinnati for two Corliss engines and 14 boilers. The latter concern are establishing a plant in Pennsylvania. One of the engines will be of 400 horse-power, the other of 175 horse-power and the boilers are each of 150 horse-power capacity.

Plans have been drawn for the erection of a large building in Norristown, Pa., by the Reading Screw Company of Philadelphia. The new building is to be four stories high, 50 x 163 feet.

Advices from Skippack, Pa., state that the Royersford Machine Company are preparing for the erection of a foundry and machine plant on the site of the former Alpha Paint & Mineral Company.

It has been decided by the Executive Committee of the American Thread Company to erect an addition doubling the plant of William Clark Company, at Westerly, R. I. William Clark, Jr., has been appointed general manager of the Westerly plant by the trust.

Improvements to the extent of \$25,000 will be made to the plant of the Reinecke Coal Company of Madisonville, Ky. New boilers will be installed and an electric plant erected. Machinery is now being purchased.

The Shiffler Bridge Company of Pittsburgh are shipping this week material to Monterey, Mexico, for a steel frame smelting furnace building for M. Guggenheim's Sons' smelting works. The company have also received a contract for a blast furnace building to be erected at Chihuahua, Mexico, for the Industrial Compagnie Mexicana. The firm are also constructing a steel dam in Venezuela.

Architects Spencer Roberts and George U. Rehfus of Philadelphia are finishing plans for a \$150,000 pier to be erected at Atlantic City, N. J.

Bridges.

The Chicago, Milwaukee & St. Paul Railroad, at Davenport, Iowa, have begun to replace the Eddy street viaduct with a steel structure.

The Youngstown Bridge Company have been awarded the contract to build the Shark River, N. J., bridge for the Atlantic Coast Electric Railroad Company.

The General Assembly of Rhode Island has passed an act authorizing the city of Providence to borrow \$320,000 to build a bridge.

A bill has been passed in the Minnesota Legislature authorizing the construction of a dam and bridge across the Mississippi River, at Grand Rapids, Minn.

A charter has been granted to the Pennsylvania Contracting Company, at Newport News, Va. The applicants were I. C. White, W. A. Post, J. A. Willett, Joseph Charles and J. R. Barham. Capital authorized at not less than \$50,000, nor more than \$100,000, with principal office at Newport News.

Two bridges are to be built at Joliet, Ill., and the plans, as submitted, have been approved by the Council.

The F. R. Long Company have been incorporated in New Jersey, with principal office at 129 Market street, Paterson, for the purpose of bridge building. Capital, \$25,000. Frank R. Long, Elizabeth F. Long and Charles A. Long of New York are the incorporators.

The County Commissioners, at Brownville, Fla., have ordered a bridge constructed across Pean River.

The Keystone Bridge Company of Pittsburgh have contracted for superstructure for three bridges, to be built west of Stockton, Cal., for the Sacramento & San Joaquin Railway Company.

The Reading Railroad will replace the old wooden bridge across the Susquehanna River, at Rupert, by an iron structure 1413 feet long. The new bridge is to be single track, and will have nine spans, and will cost not less than \$85,000.

At Binghamton, N. Y., a special election was held to decide the question of bonding the city in the sum of \$40,000 for the erection of a bridge at Tompkins street, and resulted favorably to the proposition.

Bids will be received at the County Auditor's office, Columbus, Ohio, until noon April 1, for labor and material for three bridges. Plans, specifications and rules for submitting bids may be obtained by addressing W. H. Halliday, County Auditor and Clerk to Board of County Commissioners.

The city engineer of Chicago has asked for more than \$2,000,000 for bridges and repairs. The committee may possibly recommend taking \$250,000 from the general fund, which now amounts to \$1,300,000.

The New York, Philadelphia & Norfolk Railroad is to construct a \$75,000 steel bridge at Pocomoke, Md.

A special committee has been appointed at Rochester to prepare plans for a new bridge a mile below the Driving Park Avenue Bridge. Supervisor Yates is chairman. The estimated cost is \$125,000.

Columbus, Ohio, is about to issue \$120,000 bonds for bridge purposes.

Bridge Commissioner John L. Shea of Brooklyn has made requisition for \$750,000 for the proposed Vernon Avenue Bridge over Newtown Creek, and for \$200,000 for the Grand Street Bridge over the same waterway. Both are to be swing bridges. Both of the present structures have been condemned, and the Secretary of War has decided they must go, whether replaced or not.

The Owego (N. Y.) Bridge Company have the contract to erect a modified Pratt truss bridge over Fall Creek, at Cornell Heights, N. Y. The bridge is to be 194 feet long and 120 feet above the creek.

The *Cleveland Plain Dealer* publishes a special dispatch from Youngstown to the effect that the Youngstown Bridge Company were offered specially strong inducements to join the trust, and Secretary Schmidt and Superintendent Kennedy, who represented that company at the meeting, accepted the terms conditional on ratification by the stockholders. "The company were very shy of the combine promoters' proposition at first, but the inducements offered finally were too great to be longer withheld."

The Phoenix Bridge Company have been awarded the contract for the Minneapolis and St. Louis Extension Bridge over the Cottonwood River, near New Ulm.

Fires.

The Ames sash and blind factory on Clark street, East Syracuse, N. Y., was burned to the extent of \$30,000.

All of the machinery operated in the plant of the Watsontown Planing Mill of Watsontown, Pa., was destroyed in a \$30,000 fire.

A fire in the factory building at South Eleventh street and Kent avenue, Brooklyn, wrought \$160,000 worth of destruction last week. The sufferers were Merrill Bros., machinery, \$50,000; New York Leather Belt Company, \$100,000; Davis silver polishing concern, \$5000, and Todd & Co., \$500.

The main foundry and engine room of the Crown Smelting Company, Chester, Pa., was burned; loss, \$25,000.

The plant of the Wisconsin Chain Company, Port Washington, Wis., covering three blocks, was destroyed. Reported loss, \$300,000; fully insured.

Metal Market.

Office of *The Iron Age*, 232-238 William street, NEW YORK, March 1, 1899.

Pig Tin—Is firm and a better demand for spot was noticeable during the latter portion of the week. At the close to-day spot was quoted 23.85c. to 24c. Arrivals so far this month amount to 785 tons and the afloats are now 3950 tons, which will all be available during this and next month. It seems that our present monthly consumptive requirements amount to about 2500 tons, and it looks now as though we will need a good portion of new supplies during the next two months, as the premium which exists on spot goods will be carried on for some time to come. London has fluctuated as usual, declining to £106 on Monday but since recovering to £107 10s., which was the closing cable to-day.

Copper.—The market here has been quiet, but spot delivery remaining scarce. Spot Lake Superior Ingots is nominally quoted 17.75c. Electrolytic Ingots, Cake and Wire Bars are quoted 17 $\frac{1}{4}$ c. to 17 $\frac{1}{2}$ c., and Casting Copper is firm at 17c. to 17 $\frac{1}{4}$ c. Exports until yesterday amounted to 1801 tons. The London market declined on Monday to £69 17s. 6d., but closed firmer to-day at £13s. 9d. for both spot and three months' futures. Best Selected declined to £75, which is just £1 10s. lower than last week's figure.

Pig Lead.—The week opened rather dull and considerably lower than last week. On Monday sales were reported as low as 4.22 $\frac{1}{2}$ c., but yesterday the market advanced rapidly and closed to-day at 4.30c. to 4.35c. Indications are in favor of the article and further advances are predicted. Although there is not very much of the metal changing hands, the scarcity of sellers holds the price up. St. Louis telegraphed this afternoon an advance to 4.15c., buyers, but no sellers. London was steady at £13 17s. 6d. for spot Soft Spanish. We note in another column details of negotiations which are nearing a close for the combination of the Silver Lead producers.

Spelter.—In firm and spot is held at 6.30c. to 6.37 $\frac{1}{2}$ c. March and April were, however, obtainable at 6 $\frac{1}{4}$ c. St. Louis telegraphed at the close to-day a weaker market, with sales at 5.80c., while London declined to £27. The Ore market is firm, with sales recorded for the week up to \$43 for best grades.

During the last week the Edgar Zinc Company assumed charge of the Glendale Zinc Works, which have for the last 25 years been operated in St. Louis individually by S. C. Edgar. The Edgar Zinc Company are a stock company who are now completing the erection of new smelting works at Cherryvale, Kan., which is within the gas belt. S. C. Edgar is president and general manager of the new company. Alfred Clifford is vice-president and treasurer, and Wm. B. Edgar is secretary. The new company will operate both the new Cherryvale plant and the old Glendale plant at St. Louis. We are informed that several of the directors in the Edgar Zinc Company are also interested in the American Steel & Wire Company. Naturally the new Cherryvale works will come in for a good portion of the Wire Company's business. The St. Louis plant will continue to produce the standard Glendale brand of Spelter. The general management will continue about the same. Edward F. Byrne, who has for more than 27 years been the sales agent for Glendale Spelter, will continue in that same capacity, with offices in the Woodbridge Building, New York.

Antimony.—Remains unchanged. Hallett's is strong at 10c., and Cookson's is firm at 10c. to 10 $\frac{1}{4}$ c.

Nickel.—Is strong and prices for small lots, which are about the only business doing, are firm at 38c. to 40c., according to quantity and delivery.

Tin Plates.—The American Tin Plate Company maintain the position which they assumed last week, and still

refuse to quote on future delivery. The market, therefore, has throughout the entire week been entirely in the hands of the jobbers, who are demanding prices as close to the importation price as is possible. The figures at which the jobbers have been selling to-day are said to be on a basis of about \$4.25 per 100-pound box.

New York.

Office of *The Iron Age*, 232-238 William street, NEW YORK, March 8, 1899.

Pig Iron.—Sales have been restricted through the inability of the furnaces to make early deliveries and their disinclination to book orders for distant delivery. Prices have advanced further, but they must be largely considered nominal. We quote as follows: Lehigh and Schuylkill Irons. No. 1 Foundry, \$14.75 to \$15.25; No. 2 X, \$13.50 to \$14; No. 2 Soft, \$13.25 to \$13.50; No. 2 Plain, \$13 to \$13.25, and Gray Forge, \$13.25 to \$13.50. Southern brands are quoted: No. 1 Foundry, \$14.25 to \$14.50; No. 2 Foundry, \$14 to \$14.25; No. 1 Soft, \$14 to \$14.25; No. 2, \$13.75 to \$14, and Gray Forge, \$13.25 to \$13.50.

Cast Iron Pipe.—Aside from one lot of about 3000 tons for Brooklyn there are no large orders in the market as yet. No details have yet been received as to the results of the bids on 20,000 tons of Pipe for Yokohama, which went in some time since.

Steel Rails.—Eastern mills report sales aggregating about 25,000 tons of Standard Rails at private terms.

Track Fastenings.—We quote: Angle Bars, 1.20c. to 1.25c.; Spikes, 1.55c. to 1.60c., and Bolts and Nuts, 1.80c. to 1.90c.

Finished Iron and Steel.—Among the contracts closed during the week is a lot of about 600 tons of Structural Material for the Rogers-Peet Building. Some other good sized contracts have also been let. We quote as follows: Beams, 1.55c. to 1.65c.; Angles, 1.45c. to 1.50c.; Universal Mill Plates, 1.85c. to 1.95c.; Tees, 1.55c. to 1.60c.; Channels, 1.55c. to 1.60c.; Steel Plates are 1.85c. to 1.95c. for Tank, 2c. to 2.05c. for Shell, 2.20c. to 2.25c. for Flange, 2.30c. to 2.35c. for Fire Box and 2.40c. to 2.50c. for Locomotive Fire Box, on dock. Refined Bars are 1.35c. to 1.40c. and Common Bars are 1.15c. to 1.20c., on dock. Soft Steel Bars, 1.25c. to 1.35c.; Steel Axles, 1.65c. to 1.75c.; Scrap Axles, 1.75c. to 1.90c.; Links and Pins, 1.65c. to 1.70c.; Hoops, 1.35c. to 1.40c.; Best Iron Boiler Rivets, 2.25c. to 2.50c., delivered; Steel Structural Rivets, 1.75c. to 1.85c.; Cotton Ties, 55c. to 65c. per bundle, at mill.

Philadelphia.

(By Telegraph.)

The market is very strong and prices are still hardening. Pig Iron seems to be a trifle less active, but sellers decline business at prices which would have been accepted on Monday.

There is a considerable inquiry for Billets and Slabs, but \$26 appears to be too high to bring immediate business.

Plates would command \$5 to \$8 premium for March shipments. Many inquiries come from the West and Northwest.

Bars are strong with advancing tendency. Prices on large lots are subject to special arrangement. Sheets are two to three tenths higher, with heavy sales at the advance.

Old Material is hard to get. Prices are still advancing.

Pilling & Crane have just leased the Allentown Furnace plant and will prepare one furnace for blast immediately.

The Canonsburg Iron & Steel Company (By Telegraph).—The statement that the directors of the Canonsburg Iron & Steel Company had met in Pittsburgh on Tuesday and had decided not to sell their plant to the American Tin Plate Company is untrue. The facts are that negotiations have been on for some time for the sale of the entire plant of the Canonsburg Iron & Steel Company, at Canonsburg, Pa., to the American Tin Plate Company, and the probabilities now are that the sale will be consummated in a short time, although it has not yet been actually effected.

The National Tube Works Company, McKeesport, Pa., will give their men an advance in wages varying from 5 to 10 per cent., taking effect April 1.

QUOTATIONS OF IRON STOCKS DURING THE WEEK ENDING MARCH 8, 1899.

	Sales.	Thursday.	Friday.	Saturday.	Monday.	Tuesday.	Wednesday.
Am. S. & W., Common.....	135,845	60 -61 1/4	59 1/4 -62	61 1/4 -63 1/2	62 -63 1/2	62 -62 1/2	62 1/2 -63 1/2
Am. S. & W., Pref.....	44,757	100 -101 1/4	100 1/4 -101 1/2	101 1/4 -105 1/2	103 1/4 -105	102 1/4 -103 1/2	113 1/4 -104 1/2
Col. Fuel and Iron.....	1,900	-33	-33	-32 1/2	33 -33 1/2	32 -32 1/2	32 1/2 -33 1/2
Federal Steel, Common.....	125,320	49 1/2 -51 1/2	49 1/2 -52 1/2	51 1/4 -52 1/2	50 1/4 -51 1/2	50 1/4 -51 1/2	51 1/2 -52 1/2
Federal Steel, Prefer.....	54,011	80 1/2 -88	87 1/4 -89	88 -89 1/2	87 1/2 -88 1/2	87 -87 1/2	87 1/2 -88 1/2
Tennessee Coal and Iron.....	36,600	43 1/2 -44 1/2	43 1/2 -45	45 -46	44 1/2 -45 1/2	45 -45 1/2	45 1/2 -46 1/2
Cambria Iron, Phila.....	4,380	-46	46 1/4 -46 1/2	46 1/4 -47	47 -47 1/2	47 -47 1/2	-47 1/2
Cambria, Script*.....	115,543	20 1/2 -21 1/2	21 1/2 -22 1/2	23 -23 1/2	23 1/2 -24 1/2	23 1/2 -23 1/2	23 -23 1/2
Cambria, Steel***.....	952	39 -40	40 -40 1/4	41 -41 1/4	42 -42 1/2	-42	.....
Penna. Common, Phila.....	206	60 -61	-60	.....	61 -62	.....	.....
Tin Plate Common, New York.....	19,070	38 -39 1/2	38 1/2 -40 1/2	41 1/2 -42 1/2	40 -42	39 -40	39 1/2 -40 1/2
Tin Plate Preferred, New York.....	775	.....	94 1/2 -95	94 1/2 -95	93 -94	-93 1/2	93 1/2 -94
Tin Plate Com., Chic.....	+13,886	38 1/2 -39 1/2	39 1/2 -40 1/2	40 1/2 -41 1/2	39 1/2 -41	39 -39 1/2	39 1/2 -40
Tin Plate Prefer., Chic.....	+1,865	93 1/2 -94	93 1/2 -94	94 -94 1/2	92 1/2 -93 1/2	92 1/2 -93	93 -
National Steel Common, Chic.....	+15,932	34 1/2 -36	34 1/2 -35	32 1/2 -34 1/2	30 -33	32 -33	32 1/2 -33 1/2
National Steel Preferred, Chic.....	+9,978	84 1/2 -87	84 -85	84 1/2 -84 1/2	82 -84 1/2	83 1/2 -84	83 1/2 -84

* Par \$50. ** Par \$100. *** \$1.50 per share paid in.

† Excludes Tuesday and Wednesday sales.

Iron and Industrial Stocks.

Generally speaking, iron stocks have gained during the week under review, wire showing a further advance under good sales. Federal Steel, which paid its first dividend on the preferred stock, also scored an advance. In Philadelphia, Cambria Steel has continued the feature, rising under pretty heavy sales. In Chicago, National Steel has fluctuated within somewhat wide limits, but as subscribers were given a share of common stock for each share of preferred at par the underwriting has been very profitable. There is no truth in the report that the National Steel Company had acquired control of the plant and property of Jones & Laughlins of Pittsburgh, Pa.

Industrial stocks show the following closing quotations:

International Silver, Common.....	30 1/2	to	31 1/2
International Silver, 5s.....	44	to	47
Mich.-Peninsular Car, Common.....	197	to	99
Mich.-Peninsular Car, Preferred.....	100	to	102
Mich.-Peninsular Car, First 5s.....	38	to	38 1/2
Otis Elevator, Common.....	87	to	89
Otis Elevator, Preferred.....	41 1/2	to	43
H. R. Worthington, Common.....	106 1/2	to	108 1/2
H. R. Worthington, Preferred.....	76	to	79
Cramp's Shipyard Stock.....	3	to	6
Pratt & Whitney, Common.....	40	to	50
Pratt & Whitney, Preferred.....	133	to	133
E. W. Bliss, Common.....	123	to	123
U. S. Projectile.....	90	to	95
Barney & Smith Car, Common.....	24	to	28
Barney & Smith Car, Preferred.....	62	to	62 1/2
Pressed Steel, Common.....	87 1/2	to	88
Pressed Steel, Preferred.....	30	to	30 1/2
American Car & F. Co., Common.....	63 1/2	to	66
American Car & F. Co., Preferred.....	.....	.....	.....

The American Car & Foundry Company have not been a success from the standpoint of those who underwrote the securities, since common and preferred together have been selling below par. Very little is being heard in regard to the U. S. Cast Iron Pipe Company. Apparently the underwriters have not yet proceeded to allotment nor has the personnel of the management been decided upon.

The Lead Smelters and Refiners.

Negotiation has practically been completed for the formation of a combination of the silver lead refiners and desilverizers. The name of the concern is to be the Consolidate Smelting & Refining Company. They are to have an authorized capital of \$65,000,000, half of which will be preferred and half common. Only \$29,000,000 of each stock will be issued. The stock, which is 7 per cent. cumulative, is said to have been largely oversubscribed already. The subscriptions were in the hands of Moore & Schley and Lewisohn Brothers and H. H. Rogers of the Standard Oil Company, all of New York. Following are the concerns which have entered the company:

Omaha & Grant Smelting & Refining Company.

The Consolidated Kansas City Smelting & Refining Company.

National Smelting & Refining Company.

United Smelting Company.

Pueblo Smelting & Refining Company.

Germania Smelting Company.

Chicago & Aurora Smelting & Refining Company.

Colorado Smelting Company.

Globe Smelting & Refining Company.

It will be seen from this list that the only large silver lead plant not included is the Pueblo smelting plant of M. Guggenheim's Sons, their refinery at Perth Amboy, and the Balbach Works, at Newark. It is stated

however, that there is a great possibility of the Guggenheims entering the combination in the near future.

The Mexican smelters, it is said, were not intended to be included, as their business is exclusively in foreign fields.

The company will be incorporated within a few days under the laws of New Jersey.

Cleaning Asphalt Streets.

United States Consul Erdman, at Breslau, gives, in a recent report to the State Department, the following interesting account of the methods followed in that city for the cleaning of asphalt streets: The treatment of asphalt streets here in Breslau is entirely different from methods employed in the United States. For instance: One man has charge of four squares in front of the consulate. His tools for keeping the streets clean are as follows: An iron hopper wheelbarrow, a shovel, a broom and a rubber scraper about 3 1/2 feet long. The rubber is fastened in a viselike wooden clamp and is about 4 inches wide, 1/4 inch thick, and very stiff. This man during the day is continually going over his four squares, taking up the litter and keeping the streets thoroughly clean.

Early in the morning, after having cleaned the street, he takes his wheelbarrow, loaded with very fine, sharp sand, and scatters the same with his hands or a small shovel lightly over the streets, to prevent slipping. Should it be a rainy day, he repeats this process several times during the day. Once a week two sprinkling cars are sent out alongside of each other, so that they cover the whole street at one time with water, washing the same thoroughly. Immediately following the sprinkling cars come four one-horse roller brush sweepers, about 2 feet in diameter, sweeping the water and slime into the gutter, when the same is piled up and carted away. Then the man who has charge of those streets comes along with his wheelbarrow and sprinkles sand all over the street. In spring or autumn, when the streets are often sloppy or wet, the washing is done several times during the week.

I am informed the washing is done for the purpose of removing the slime which the asphalt seems to leave, and to keep the street from being slippery; also for the preservation and hardening of the asphalt. All streets are kept in excellent condition, the shopkeepers or tenants not being permitted to put sweepings on the pavement or street. These must be taken up and put in a box kept for that purpose.

The city has wire baskets fastened on lamp posts, against houses, fences or trees, in which the public may throw waste paper while walking along. It is very rare to see any waste paper on the streets, as the citizens in general take pride in keeping the streets clean. The householders have to sweep the streets to the center of the street regularly every morning before six o'clock. The litter is piled up and carted away by the city teams.

The first cut of the Port Arthur Ship Channel, which is being cut by the Kansas City, Pittsburgh & Gulf Railroad, giving a depth of 18 feet from the deep water channel at Sabine Pass to the docks at the town of Port Arthur, Texas, is very nearly completed. The company will officially celebrate the opening of the channel on March 25. The new channel will permit of the uninterrupted lighterage of cargoes to vessels at the Pass, and greatly facilitate the shipment of goods from Galveston.

The Riter-Conley Mfg. Company of Pittsburgh have recently received a contract for nine plate girder bridges of 80-foot span for the Pittsburgh & Western Railroad to be erected near Butler, Pa.

A Decrease in Pig Iron Production.

A Further Decline in Furnace Stocks.

Production fell off quite heavily during February, the record of a very considerable number of the plants making a good deal less than their usual average. Besides this quite a number of active stacks were stopped from different causes, while very few furnaces long idle were added to the list of active producers.

The weekly capacity of the furnaces in blast on March 1 compares as follows with that of preceding periods:

	Furnaces in blast.	Capacity per week. Gross tons.
March 1, 1899.	192	228,195
February 1.	195	237,639
January 1.	200	243,516
December 1, 1898.	195	235,528
November 1.	196	228,935
October 1.	192	215,635
September 1.	180	213,043
August 1.	187	206,777
July 1.	185	216,311
June 1.	190	225,398
May 1.	194	234,163
April 1.	194	233,339
March 1.	193	234,430
February 1.	184	228,358
January 1.	188	226,608
December 1, 1897.	191	226,024
November 1.	183	213,159
October 1.	171	200,128
September 1.	161	185,506
August 1.	152	165,378
July 1.	145	164,004
June 1.	146	168,390
May 1.	146	170,528
April 1.	153	173,279
March 1.	156	169,986
February 1.	154	162,959
January 1.	154	159,720
December 1, 1896.	147	142,278
November 1.	133	124,077
October 1.	130	112,782
September 1.	145	129,500
August 1.	173	157,078
July 1.	191	180,532
June 1.	194	182,220
May 1.	196	189,398
April 1.	200	187,451
March 1.	207	186,583
February 1.	215	198,599
January 1.	241	207,481
December 1, 1895.	242	216,797
November 1.	239	217,306
October 1.	232	201,414
September 1.	215	194,029
August 1.	200	180,525
July 1.	185	171,194
June 1.	172	157,224
May 1.	171	156,554
April 1.	171	158,132

The status of the charcoal furnaces was as follows:

Charcoal Furnaces in Blast March 1, 1899.

Location of furnaces.	Total No. of stacks.	No. in blast.	Capacity per week.	No. out of blast.	Capacity per week.
New England.	11	9	175	9	850
New York.	13	1	190	0	0
Pennsylvania.	13	1	60	12	610
Maryland.	4	0	0	4	569
Virginia.	4	0	0	4	437
Ohio.	7	1	50	6	440
Kentucky.	3	0	0	3	200
Tennessee.	9	2	292	7	2,310
Georgia.	3	0	0	3	670
Alabama.	12	1	270	11	2,518
Michigan, Missouri and Wisconsin.	18	7	3,293	11	4,190
Texas.	4	0	0	4	875
Utah.	1	0	0	1	175
Oregon.	1	0	0	1	275
Totals.	92	16	4,330	76	14,119

As compared with previous months the record of active charcoal furnaces stands as follows:

	Furnaces in blast.	Capacity per week.
March 1, 1899.	16	4,330
February 1.	17	4,967
January 1.	20	6,026
December 1, 1898.	18	6,018
November 1.	20	5,947
October 1.	20	5,732
September 1.	21	6,293
August 1.	15	6,459
July 1.	19	5,647
June 1.	20	6,762
May 1.	18	6,571
April 1.	16	5,716
March 1.	16	5,470
February 1.	14	4,734
January 1, 1898.	16	5,442
December 1, 1897.	19	5,061
November 1.	19	4,656

October 1.	20	4,632
September 1.	21	4,555
August 1.	20	4,003
July 1.	14	2,894
June 1.	15	3,321
May 1.	13	3,729
April 1.	16	5,368
March 1.	18	5,425
February 1.	18	5,144
January 1, 1897.	19	5,456

The status of the coke and anthracite furnaces was as follows:

Coke and Anthracite Furnaces in Blast March 1.

Location of furnaces.	Total No. of stacks.	No. in blast.	Capacity per week.	No. out of blast.	Capacity per week.
New York.	11	3	4,206	8	6,164
New Jersey.	3	3	1,755	0	0
Spiegel.			492	0	0
Pennsylvania:					
Lehigh Valley.	32	9	5,865	23	9,050
Spiegel.	1	0	0	1	90
Schuylkill Valley.	11	6	4,419	5	3,647
Upper Susquehanna Valley.	4	3	2,574	1	600
Lower Susquehanna Valley.	19	4	3,716	6	2,221
Lebanon Valley.	11	8	5,542	3	2,355
Spiegel.	1	1	534	0	0
Pittsburgh District.	30	28	57,000	2	3,873
Spiegel.	2	1	1,908	1	1,900
Shenango Valley.	16	9	14,139	7	6,909
Western Pennsylvania.	20	9	11,922	11	5,994
Spiegel.	1	1	700	0	0
Maryland.	5	2	4,000	3	3,650
Wheeling District.	9	3	10,313	1	1,080
Ohio:					
Mahoning Valley.	13	10	16,279	3	3,256
Central and Northern.	9	8	12,694	1	1,400
Hocking Valley.	2	1	300	1	550
Hanging Rock.	12	6	2,642	6	1,432
Illinois.	16	14	27,609	2	1,750
Spiegel.	1	1	965	0	0
Minnesota.	1	0	0	1	629
Wisconsin.	4	2	2,080	2	1,610
Missouri.	2	1	950	1	600
Colorado.	3	1	1,000	2	2,000
The South:					
Virginia.	22	7	5,024	15	9,300
Kentucky.	5	3	1,496	2	1,305
Alabama.	30	18	18,706	12	9,100
Tennessee.	11	6	5,035	5	3,700
Georgia.	2	0	0	2	960
North Carolina.	2	0	0	2	600
Totals.	304	175	223,865	129	85,725

In comparison with previous months the record of the coke and anthracite furnaces stands as follows in gross tons:

	Number in blast.	Capacity per week.
March 1.	175	223,865
February 1.	178	232,672
January 1, 1899.	180	237,490
December 1, 1898.	177	229,510
November 1.	176	222,988
October 1.	172	209,903
September 1.	165	206,750
August 1.	165	200,318
July 1.	168	210,664
June 1.	170	218,636
May 1.	176	227,562
April 1.	178	227,823
March 1.	177	228,960
February 1.	170	223,604
January 1, 1898.	172	221,106
December 1, 1897.	172	220,062
November 1.	164	208,503
October 1.	151	195,492
September 1.	140	180,951
August 1.	132	161,375
July 1.	131	161,170
June 1.	131	165,059
May 1.	133	166,790
April 1.	137	167,911
March 1.	138	164,561
February 1.	136	157,815
January 1, 1897.	135	154,264

During February there were blown out: Alice in the Shenango Valley, Ivanhoe in Virginia, one Ashland in Kentucky, Lawrence in Ohio, one Hubbard in the Mahoning Valley and Embreeville in Tennessee. Work was resumed at one Crane in the Lehigh Valley, one Sharon Iron Company in the Shenango Valley and one De Bardeleben in Alabama.

Furnace Stocks.

The position of furnace stocks, sold and unsold, as reported to us, was as follows on March 1, the same furnaces being represented as in former months. This does not include the holdings of the steel works producing their own iron:

Stocks.	Oct. 1.	Nov. 1.	Dec. 1.	Jan. 1.	Feb. 1.	Mar. 1.
Anthracite and coke.	511,413	458,111	441,971	402,260	385,311	318,379
Charcoal.	110,315	114,901	107,353	104,315	97,593	98,094
Totals.	621,728	573,012	544,024	506,575	462,904	416,473

Warrant Stocks.

We are indebted to the American Pig Iron Storage

Warrant Company for the following statement of stocks of warrant iron:

Stocks,	Oct. 1.	Nov. 1.	Dec. 1.	Jan. 1.	Feb. 1.	Mar. 1.
Coke and Anthracite.....	175,700	157,300	122,000	113,100	100,700	95,000
Charcoal.....	39,900	40,300	38,800	37,700	34,500	31,300
Totals.....	215,600	197,600	160,800	150,800	135,200	126,300

The Naval Appropriations.

WASHINGTON, March 7, 1899.—In the closing hours of the last session of the Congress which expired at noon on Saturday last the annual Naval Appropriation bill was rushed through in a form wholly unsatisfactory to the Navy Department and to both the advocates and opponents of the principal features of the provisions covering the proposed increase in the navy. As the bill finally became a law the House provision authorizing the construction of three battle ships, three armored cruisers and six protected cruisers was adopted, but it is the opinion of the leading officials of the Navy Department that this entire section except the provision for six protected cruisers, which do not require armor, has been rendered inoperative by coupling with it the proviso that the Government pay shall not exceed \$300 per ton for armor and that no contracts shall be let for the hulls of the proposed vessels until the Secretary of the Navy shall have contracted for the armor for such vessels at the price stipulated in the act.

In the brief interval that has elapsed since the Naval bill became a law, the officials of the Navy Department have had no opportunity to decide upon a general policy with reference to the proposed increase in the navy, but the opinion is very freely expressed that, except as to the protected cruisers, it will be found impossible to let a single contract, either for a vessel or for armor, and therefore that until new legislation is provided no progress whatever can be made. In this connection the bill is also very disappointing in its provisions relating to the armor for the three battle ships authorized a year ago, but for the armor of which no contracts have been let. The Secretary of the Navy and his aides were very anxious that Congress would authorize the purchase of Krupp armor for these vessels, it having been fully demonstrated to the Department's satisfaction that armor made by this process is much superior to Harveyized armor, and the ballistic requirements of the Ordnance Bureau having been increased 25 per cent. on the basis of the tests made at Indian Head under official supervision. The utmost concession that could be obtained from Congress, however, was an amendment to the bill authorizing the Secretary to pay \$400 per ton for the armor for the battle ships referred to. The result of this provision will be simply to continue the use of Harveyized armor so far as last year's vessels are concerned, though it is now conceded to be much inferior to the armor now being manufactured for the vessels for third class powers like Japan.

The debate in the Senate over the provisions relating to the new ships and their armor was most significant, as showing the hostile attitude of a number of Senators toward the American manufacturers and the willingness of the majority to be misled by demagogical utterances supported by an aggregation of wholly false or highly colored statements. The entire discussion was highly suggestive and the extracts given below will no doubt be read with much interest:

When the feature of the bill relating to the increase of the navy was reached Senator Tillman of South Carolina, who has been prominent heretofore in the same connection, offered an amendment requiring that the Secretary of the Navy should purchase armor "of the best obtainable quality" at an average cost not exceeding \$300 per ton, including royalties, with the proviso that in no case should a price be paid in excess of that paid to any manufacturer in the United States for such armor by any other government. The keynote of Mr. Tillman's remarks, which were continued at intervals throughout the day's session, was found in his opening statement in support of his amendment.

"We thought," said he, "that we had settled this question of the proper price to pay for armor on two previous occasions, and the Senate did settle it by an overwhelming vote, refusing to pay more than \$300 per ton. But last year when the war fever was on us and we all felt that though the battle ships which were then on the stocks could not be used in that war it was necessary to display a warlike readiness to equip the navy and to hurry forward as rapidly as possible additional vessels, the Senate agreed to raise the price from \$300 a ton to \$400 for the seven new vessels ordered last July. Now we have a proposition sent here from the House to pay \$445 a ton under conditions and limitations which, considering the exposure which has been made on this floor time and again of the robbery of the Government by the armor trust, are to me most astonishing.

"I am not proposing to consume the time of the Senate, because I never filibuster without announcing that I am filibustering, and there is nothing in this proposition to make it warrantable on my part to delay the Senate any longer than is necessary to present the facts fully for its consideration and to put them in the Congressional Record for the use of the country, to let the people see what is being done here and how these millions and other hundreds of millions are to be squandered if we shall accede to this proposition." At this point Mr. Tillman asked to have read the communication from Captain O'Neil, Chief of Ordnance, which was printed in *The Iron Age* a week ago. To Captain O'Neil's statement were appended letters from the Bethlehem and Carnegie companies, stating that \$545 per ton was the lowest price at which Krupp armor could be furnished, and expressing a preference to furnish Harveyized armor at \$400 per ton rather than Krupp at the advanced price. Following the reading of these documents there was submitted to the Senate a memorandum from Captain O'Neil, written after the passage of the Naval bill by the House, in the course of which he said:

"There is a degree of ambiguity in the language of the House amendment which may lead to great embarrassment hereafter—that is, whether the Department is restricted to procuring armor of the best obtainable quality or to procuring the best armor that can be obtained for \$445 per ton, there being a wide difference between such requirements. The language of the law should be unequivocal in order that the intention of Congress may be clearly defined.

"If the Department is required to supply armor of the best quality, and which costs more than \$445 per ton, it cannot do so, and therefore would not be justified in entering into any contract at all, as it could not, under such restriction, contract for any armor. If, on the other hand, the Department is required to supply armor of the best quality that can be procured for \$445 per ton, it can do so, but such armor will be practically the same that is now supplied, and which can be had for \$400 per ton (plus royalty of \$11.20, if it has to be paid).

"The Department has already informed the chairmen of the Senate and House Naval Committees that a better quality of armor than that heretofore supplied can and ought to be procured. The price named for such armor is \$545 per ton, including royalty of \$45. The accompanying letters from the armor manufacturers are put in evidence as to the cost.

"The Bureau is informed to-day by a representative of the Carnegie Steel Company that the price paid by the Cramps for the Krupp armor they have ordered from the American manufacturers to use on the Russian battle ship now building at their works is \$575 per ton.

"It is most important that by July next the Department shall contract for about 10,000 tons of armor for the battle ships "Maine," "Missouri" and "Ohio," and for the four harbor defense monitors, as these vessels are now under contract, and unless provision is made at the proper time for their armor it is to be considered whether the shipbuilders will not have grounds for claims arising out of delays due to the non-receipt of armor. It must not be supposed that the manufacturers are trying to force on the Government the so-called Krupp armor, for such is not the case. They have stated that they prefer to make armor as at present, at present prices, rather than the Krupp armor at proposed prices.

"The Bureau of Ordnance desires to be placed on record as recommending to the Department that only the best quality of armor that can be obtained in this country shall be placed on vessels of the United States Navy, regardless of price. To do otherwise will destroy the prestige of our naval vessels, and the Bureau trusts that such steps will be taken by the Department as will absolve it entirely from responsibility in the matter if it is forced to procure armor of a quality inferior to the best that can be manufactured."

In commenting upon Captain O'Neil's letter Mr. Tillman ridiculed the statement that if the Government desired the best armor obtainable it could not be had at \$445, the price authorized by the House bill. If this was the case, he said, it was clearly the duty of the Government to build its own armor plant.

"I have heard Senators this evening, and I have heard them before, argue that the Government cannot profitably carry on any manufacturing process or compete with private corporations and capital in the manufacture of munitions of war or anything else. But we have in the navy yard here in Washington a gun factory where we are making the most improved ordnance in the world, equal to that made at Krupp's or anywhere else, and with it our navy is armed. It is made under Government control by the Government, and naval officers are in charge of the work. Why can we not make armor in the same way? Simply because, so far as I can see, these two Pennsylvania corporations have a 'pull' at the other end of the Capitol, and they send their bill here for \$445 a ton and we do not reduce it.

I do not know what the word 'pull' means. I see it in the press. Somebody who understands it will please explain it. I do not know whether it is bribery or what it is. It is something that ought not to be used or have any efficacy in the Congress of the United States."

Continuing, Mr. Tillman rehearsed the time worn charges against the Carnegie Company concerning the furnishing of armor containing blow holes and other imperfections, and then demanded that the present policy of constructing war ships by private enterprise should be abandoned and the vessels built in Government yards. He conceded that it would cost more, but asserted that the money would go to the laborer rather than to the capitalist. "If you are an honest friend of labor," said he, "you would say the Government itself should build all its ships, let them cost double or triple what they would cost at a private yard, because the American laborer would get the benefit rather than the American capitalist."

Senator Gallinger of New Hampshire acquiesced in Mr. Tillman's declaration, saying that he would be prepared to authorize an increase in cost of 20 per cent. to have the war ships built in Government yards. Mr. Tillman then read from the *Record* giving the vote on the motion to reduce the price of armor to \$300 when the last Naval Appropriation bill was pending, which was carried by 36 to 12, and he then invited Senator Chandler to give the Senate the history of the agitation which resulted in the increase to \$400 per ton. After Mr. Chandler had complied with this request he undertook to describe the difference between the Harvey and Krupp processes, declaring that "in the absence of more evidence that the Krupp armor is better armor and more expensive armor, I for one decline to be enticed away from the solid basis upon which the Senate has placed itself upon previous occasions to consent to spend several million dollars in purchasing this new armor at an additional cost of \$145 a ton."

"I must be excused," continued Senator Chandler, "for distrusting the armor manufacturers of this country and of Europe when they demand these prices. It is to be borne in mind that a year ago, when we consented to compromise this question by agreeing to pay \$400 a ton for armor, the manufacturers protested that that was a great injustice to them; that they could not make the armor at a profit; that they only consented to do it because of the exigency which was upon the country—three battle ships having been authorized, the hulls contracted for and no armor authorized or contracted for. And so, reluctantly, they told us they would build armor for these three ships at \$400 a ton, but they said there was no profit in it, and the idea was distinctly carried that they were building the armor at \$400 at a loss."

Mr. Chandler then read extracts from the letters from the Bethlehem and Carnegie companies, stating that they would prefer to manufacture Harvey armor at \$400 per ton rather than Krupp armor at \$545, and declared that "either of these statements which are now before us or they misstated to us a year ago when they told us they could not manufacture armor at \$400 a ton at any profit."

Taking up the question of a Government armor factory, Mr. Chandler declared that he was not willing to pay 27 cents a pound for armor plate, and would rather that the construction of the navy be delayed, if necessary, until the subject could be investigated. In case the manufacturers refuse to furnish Krupp armor at \$300 per ton, he was ready to advocate what he had never before voted to do—namely, to provide for the establishment of a Government plant.

Senator Butler of North Carolina then took up the discussion, presenting the following amendment:

"For armor, \$2,700,000: Provided, That no part of this sum shall be expended, except in procuring armor of the best obtainable quality, at an average cost not exceeding \$300 a ton of 2240 pounds, including royalties. In case the Secretary of the Navy shall find it impossible to make contracts for said armor within the limits as to the price above fixed, he shall be, and is hereby, authorized to lease, purchase or establish a Government armor factory of sufficient capacity to make such armor, and to proceed to the manufacture of the armor necessary for said battle ships and armored cruisers. In executing this authority, he shall prepare a description and plans and specifications of the land, buildings and machinery suitable for the factory, and shall advertise for proposals to furnish such land, buildings and machinery as a whole plant, or separately for the land and buildings, or the whole or any part of said machinery; and he shall make a contract or contracts for such land, buildings and machinery with the lowest and best responsible bidders: Provided, however, That he shall not purchase any of the land, buildings or machinery of the two existing armor plate factories."

"The Secretary shall also appoint an armor factory board, to consist of competent naval officers of suitable rank, to advise and assist him in executing the au-

thority hereby conferred. For the establishment of said armor factory, the sum of \$1,500,000, or so much thereof as may be necessary, is hereby appropriated, and in addition, the sum of \$2,000,000 is appropriated, or so much thereof as may be necessary, to be used in making the armor for said battle ships at said factory."

In the discussion that followed upon this amendment the influence of so-called "popular sentiment" upon the votes of certain Senators was graphically shown. Senator Stewart, for example, expressed himself as follows:

"I should like to remark, in connection with the subject, that it matters not whether it be a good scheme or a bad scheme so much as it matters to have the good opinion of the country. The country believes that the armor monopoly has taken advantage of the situation and is extorting money from the Government. This is the general conviction. I do not suppose you could find 100 men on the outside who are not of that opinion. I think it would be better to sacrifice \$1,000,000, \$2,000,000 or \$5,000,000 in attempting to build Government works to compete with the present armor factories than to have this impression continually upon the minds of the people."

"The objection that I hear everywhere against the navy is to this armor plate swindle, for it really involves a swindle in the armor plate manufacturing for the navy. If anything can be done to remove the impression that there is an armor plate swindle to which the Government is subjected, that it controls legislation, that it has its own way because it has a monopoly, and that the Government is under the necessity of having this armor, it ought to be done. The country regards this monopoly in the light of a highwayman, with pistol in hand, holding up the Government and ordering it to stand and deliver."

At the request of Senator Tillman, Senator Butler's amendment providing for a Government armor factory was withdrawn in order to permit a vote to be taken on the question of the price to be paid for armor on the new war ships, and Mr. Tillman's proposition to reduce the House figure of \$445 to \$300 was adopted by a vote of 34 to 26.

Senator Butler then renewed his amendment for a Government plant and in discussing it caused to be read the alleged copies of the Krupp and Harvey patents previously referred to in the House debate. In commenting upon these patents he declared that the evidence from the official records all tended to show that the Harvey process was better and fully as expensive, and that therefore the claim that the Krupp armor ought to be used was contrary to fact. In this connection he said:

"It will also be seen that no satisfactory tests have been made by our Government of the Krupp. It will be seen that they have not been tested with the best American projectiles but with inferior ones. It was claimed in the House of Representatives that the Krupp process is secret, and presuming this claim would be made here, I secured copies of the specifications and have put them in the record. No official information is obtainable, to my knowledge, that the Krupp Company are actually making in a practical way any armor which is equal to ours, excepting it is made by our process. So far as I can learn, only thin plates—not exceeding six inches—have been produced by the so-called Krupp process. In short, there is nothing in the claim but a last effort to still further fool Congress and to still further rob the Treasury by furnishing an inferior article at a very high price, a quality of armor that we do not want at any price. One word further. Even if we could buy armor at \$300 a ton from this armor trust it seems to me every American citizen would prefer to see it made in his own factory, where the best material can be gotten, without any blowholes or plugging, so that the best armor that could be made would go on our battle ships and armored cruisers. Even if it costs more, we cannot afford to have the armor of our ships defective, with blowholes and plugs, so that if a shot from the enemy should strike that spot we would lose several millions of dollars and hundreds of our sailors."

The only protests against the Butler amendment were made by Senators Hawley and Hale. Mr. Hawley said:

"I am very much opposed to the Government undertaking to build great plants for the manufacture of articles that can be bought of the highest excellence in private factories. The experience of foreign governments has not, as a rule, been favorable to government factories. They cannot make them so cheaply. They have never done so. Krupp's establishment is furnishing the guns for Germany. There are other corporations in France; so in Great Britain. I am very sorry to see the very undemocratic doctrine gaining ground that everything for the Government ought to be done by the Government; that we should set up factories for the manufacture of every article required. It would simply add to the enormous force employed by the Government. It has not been thought desirable heretofore. It has been considered good policy to keep down to the lowest figure the num-

ber of men employed and not to enter upon schemes like this. It will cost an enormous sum and will employ a great number of men, and in the end not be as satisfactory."

Senator Hale's remarks were very brief, but very much to the point. He said: "The Senate has had this project before it repeatedly. It has always voted it down. In the mind of every thoughtful man there has been objection to any more great governmental establishments. The construction of the Navy has gone on almost entirely in the works, yards and places outside of Government establishments. It has gone on cheaper, it has gone on more economically, it has gone on without scandal, all of which will be involved when we create an immense governmental establishment for the manufacture of this armor. The opinion of the Senate has been so decided in this matter that I do not care to discuss it longer. I am willing to take the action of the Senate upon this proposition that at this day, after having gone on as we have, we are to build an immense governmental affair to do this work. I have no fear that Senators will do it. Instead of it costing \$1,500,000, it will cost every dollar of \$10,000,000 before it is done. It will linger and hang along as Government work does, and in the meantime we will be bound hand and foot and will do nothing."

The vote was then taken on the proposition for a Government plant, which was carried by 39 to 27. The bill was thus sent to conference with Senate amendments reducing the battle ships from three to two, the armored cruisers from three to two, the protected cruisers from six to four, the price of armor plate from \$445 to \$300 per ton, and with amendments authorizing a Government plant unless armor could be purchased at the price specified, and also requiring the Secretary to contract for armor in advance of contracting for the ships.

The struggle in conference was sharp and protracted and it was only when it became apparent that the bill must otherwise fail of passage that the House conferees accepted the Senate provision concerning the price of armor and the requirement that the Secretary of the Navy should contract for armor before contracting for the ships. The Senate accepted the schedule of 12 vessels as proposed by the House and abandoned the Butler amendment for a Government armor factory. The result was an unsatisfactory compromise, but, in the opinion of Chairman Boutelle of the House Committee, it was the best that could be done under the circumstances.

Secretary Long and his aides will take up the Naval Appropriation act this week and give its provisions very careful examination before deciding upon a policy for the department's guidance. It now seems probable that work upon the plans for the six protected cruisers will begin at once, as the only armor which they carry consists of deck plates, which are invariably furnished by the ship builders and which are not subject to the restrictions as to price provided by the new law.

W. L. C.

The Shoenberger Steel Company.—The plant of the Shoenberger Steel Company at Pittsburgh, Pa., has been acquired by the American Steel & Wire Company. It consists of two blast furnaces having a monthly capacity of 12,000 tons, a Bessemer plant of two 6-ton converters rated at 175,000 tons annually and an open hearth steel plant consisting of one 12-ton and one 35-ton acid and two modern 35-ton basic open hearth furnaces, whose capacity is rated at 100,000 tons of ingots annually. The rolling mill plant consists of the following trains: One 8-inch, two 9-inch, one 16-inch and one 22-inch bar trains, three sheet trains, one 34 x 127 inch plate train, one blooming mill and one continuous train. The Shoenberger Steel Company have for years made a specialty of steel horse-shoes, horseshoe bars and toe carks, the other leading line being sheets and plates. Quite recently the Shoenberger Steel Company have had under construction a modern wire rod mill, and it is probable that to obtain control of the latter the American Steel & Wire Company have acquired the works. By securing possession of the Bessemer Steel plant of the Shoenberger Steel Company the American Company, with the works of Oliver & Snyder Steel Company, which they own, have capacity enough to produce the billets required for the Braddock, Rankin, South Side and Beaver Falls plants. The American Steel & Wire Company fortify themselves more strongly in the control of the wire rod and allied branches.

The Clinton County (Ohio) Farmers' Institute, in session at Wilmington, Ohio, last week, adopted the following eminently sensible resolutions: "Whereas, Our Farmers' Institute for the past 12 years has been passing resolutions regulating everything, from township affairs to the national banking and currency system; and, Whereas, We have observed that the seasons come and go without any special reference to our individuality, and that the rains fall upon the just and the unjust, and in spite of our protests that trusts have been formed to control the price and output of everything under the sun, from pig iron to chewing gum; therefore be it Resolved, 1. That for this

year we allow the Government to be conducted by the duly named and sworn officers. 2. That we will raise the largest crops possible on our farms at a minimum cost, and sell them for the highest prices obtainable. 3. That we will vote according to the dictates of our individual consciences."

The American Brass Company.

Announcement has been made of the organization of the American Brass Company. The company are said to have been organized under a special charter in the State of Connecticut with an authorized capital of \$20,000,000. The company consist of six of the large brass manufacturers of the Naugatuck Valley, Conn. The combination of these interests has been attempted before, and has been under discussion for several years. The directors of the various companies have for some time been largely the same, inasmuch as that certain directors in one company were frequently directors in another. Nevertheless the companies have been operating on a competitive basis, and now the combining of the interests seems quite natural. The companies who are said to have joined the combination are:

The Coe Brass Mfg. Company of Torrington, Conn.

Holmes, Booth & Haydens of Waterbury, Conn.

The Benedict & Burnham Mfg. Company of Waterbury, Conn.

The Scoville Mfg. Company of Waterbury, Conn.

The Waterbury Brass Company of Waterbury, Conn.

Plume & Atwood of Waterbury, Conn.

Only two large brass mills are outside of the new company, these are the Ansonia Brass & Copper Company of Ansonia, Conn., and Randolph & Clowes of Waterbury, Conn.

It is stated that the officers are: Charles F. Brookes, president; C. B. Goss, J. S. Elton and T. B. Kent, vice-presidents; D. S. Plume, treasurer, and E. L. Frisbie, Jr., secretary.

From W. P. Smith.

With the return of spring weather, which made its advent in this section about ten days ago, jobbers report a marked increase both in the number of orders and the volume of tonnage, and taken upon the whole business may be characterized as far above the average.

I think, however, that a considerable percentage of the excess is what may be termed speculative—that is, covering on goods that have been going "skyward" before they get out of reach.

It is a source of gratification to note the feeling of the trade generally toward the conservative advances that have already taken place in nearly everything in which raw material cuts much of a figure. It has been apparent to any thinking business man that for some time a great many goods have been sold for about the flat cost of production, and as it is a recognized maxim that "the workman is worthy of his hire," the great majority of the trade look upon the recent advances as a blessing. I of course mean those advances which may be classed as conservative.

The danger seems to lie in not knowing when to stop. The consumption of manufactured products in this country has grown to the present maximum stage from a number of causes, prominent among which are plenty of money scattered about by the Government in prosecuting the war and the low prices of goods, which bring them within the reach of the masses.

Now the war is over and the funds so promiscuously scattered by it are fast going out of the hands of the many and lodging in the hands of the few. It is also a foregone conclusion that when prices are high consumption is greatly reduced. As evidence, take the reduced consumption of Nails a few years ago, when they reached about \$2.50 per keg, base, with 50 cents additional for 60d.

Now it seems to me that if the manufacturers will be content with just such advances as are rendered necessary, owing to the increased cost of raw material, to give them a fair margin, prosperous times and higher prices have come to stay; at least for some time to come.

On the other hand, abnormal prices must mean increased competition, decreased consumption, an excessive supply, dull trade and hard times.

HARDWARE.

Condition of Trade.

THE advances in the Hardware market announced this week are not as many nor as important as those of the past week or two, but there continues to be a general stiffening in price along almost the entire line, and in several cases open advances are made. In view of the strong tone which has now for more than a month characterized the market there has been a large volume of business, and there still continues to be a liberal movement. Buyers have been most free in placing orders in anticipation of advances, and a good many of the jobbing houses have laid in very heavy stocks. These are, with at least a fair demand from the retail trade, moving off steadily. It is to be noted that where marked advances have been made the trade are not disposed to purchase with the liberality which they manifested a short time ago, and it remains to be seen how much effect the heavy advances in some lines will have on the market. Some large buyers are more disposed than they have been to hold aloof a little and get rid of present stocks before bartering much more in the way of speculative buying. Manufacturers, many of whose advances have been made after heavy sales at old prices, are finding their prices cut by the jobbers, who frequently divide, at least, the advance with their customers. In a great many lines the jobbers' prices are now certainly lower than the manufacturers'. A good many goods are getting scarce, and the question of a shortage is becoming a pressing one.

Chicago.

(By Telegraph.)

Shelf Hardware jobbers report a continued heavy trade with an unchecked flow of business in merchandise on which the price has been advanced. It is a singular circumstance peculiar to this time that advances have not been followed by even a slight period of hesitation in which to test the strength of the market. The general conditions evidently are satisfying retail dealers that the advances are legitimate and will be sustained. Sheet Zinc has been marked up to \$8.75 on 32, 34 and 36 inch and to \$9 for 30 inch. Jobbers have also found it necessary to make a sharp advance on Steel Sheets. Tin Plate is very strong, and likely to be considerably higher owing to the fact that manufacturers have practically withdrawn all quotations. Bolts, Nuts, Rivets, Chains and other articles which are not far removed from raw material have made sharp advances in prices and are likely to be still higher. Hardware merchants should not lose sight of the market in Pig Iron and Steel Billets, as these are now governing the general situation. Great scarcity exists and no relief is in sight. Heavy Hardware jobbers are also favored with a strong demand for everything they handle.

St. Louis.

(By Telegraph.)

Shippers' floors show a very generous buying movement. All lines of Hardware are active and associated Wooden Ware moves finely. The week is not without its advance, and the telegraph lines have been immensely benefited by messages withdrawing quotations and posting travelers as to higher prices. Tinware is going at an increase, and a further advance of 10 cents per box is reported on Tin Plate. Revised prices have been made on Dripping Pans, Bird Cages and Bright Wire Goods of all

kinds. Strap and T Hinges, also the case goods, show substantial gains. In the heavier lines Sledges and Axes are not behind, and factories are now demanding higher prices. Both Galvanized and Japanned Coal Hods come into line with advances of from 10 to 20 per cent. Cabinet Lock Hardware must be purchased at a 20 per cent. raise, and Carriage Bolts show an advance of about 8 per cent. Jobbers' stock of Wire Cloth is growing steadily less, and Screen Goods bid fair to bring higher prices in view of the scarcity.

From Charles H. Wier.

Trade continues very satisfactory throughout the South. The jobbers are still busy and report good sales. The rapid advance in prices of many lines of Hardware has caused more or less speculative buying and must not be taken as an indication of a wonderful improvement in business. The tendency on the part of the trade at present is to restrict their purchases of such goods as have made very great advances to actual wants only. The continued increase in prices of certain goods has caused more or less doubt in the minds of many as to the permanency of some of the advances, and a lack of confidence is beginning to manifest itself.

A healthy advance in values is desired by all, and it is to be hoped that the prospect of a good trade on a paying basis will not be jeopardized by fictitious advances to such an extent as to cause a loss of confidence and bring about the condition of the past eight years, of buying for actual wants only.

From Geo. H. Bartlett.

I have just finished a seven weeks' trip and if business is not booming everywhere I have not discovered it. The commercial tourist has to make his trip more slowly nowadays than he did a few months ago, for the buyers are kept very busy making changes in prices. One jobber told me his firm had sent out over 80 change sheets since January 1. It is pleasant to see Hardware going up once more. It had gone into such a decline that some of us thought it would never get on its feet again. It would seem that heroic treatment had to be used to restore it to a normal state, so pools, trusts and consolidations were used in anything but homeopathic doses, and the patient is getting well fast and the Hardwareman's patience is also saved further shocks of marking down costs. The shrinkage for years had been worse than that of the woolen undershirt worn by the small boy in the soap advertisement, with which we are all so familiar. I imagine that notwithstanding the advances that have already taken place there isn't an article in the whole list that won't go still higher. Wire Goods seem to take the lead in rapid jumps, and so it came about that the advance in Poultry Netting caught the hens at a time when they had taken many advance orders for Lent. The hens "cacklelated" that being in the Hatch-it line they ought to come in for their share in the better prices of Hardware and refused to shell out at figures that made omelets higher than quail on toast.

There is considerable anti-consolidation talk heard, especially when one is traveling on a local train and the farmer who knows it all speaks his little piece, but the majority of business men realize that without united action on the part of manufacturers no one can know where he is at.

Notes on Prices.

Wire Nails.—The advance of 25 cents a keg on Wire Nails, made February 27 and noted in our report last week, has had the effect of somewhat curtailing orders. The volume of business preceding the advance was so large that some factories are well filled with orders for delivery during the present month, while others are not anxious to take new business. Prices are as follows, f.o.b. cars Pittsburgh or Cleveland: To large buyers in carload lots, \$1.85; to large buyers in less than carload lots, \$1.87½; to small buyers in carload lots, \$1.90; to small buyers in less than carload lots, \$2.

New York.—There is a moderate distribution of Nails at the present time, with the promise of a large demand later in the season. Building operations which were deferred last year and which will be carried to completion this season are expected to influence the consumption of Nails favorably. At the recent advance prices are as follows: Carload lots on dock, \$2.05; small lots from store, \$2.20 to \$2.25.

Chicago, by Telegraph.—Manufacturers report a continuance of the active demand for Wire Nails. The great scarcity of Steel would seem to point to further advances in the near future. The price of Nails seems low in comparison with other products. It is necessary at present to pay 2 cents per pound for ordinary Plate Steel in carload lots, Chicago, for immediate shipment, and other heavy Steel products are not much cheaper. Carload lots of Nails are selling at \$2, Joliet or DeKalb. Jobbers quote small lots at \$2.10 and report as good a demand as last month.

St. Louis, by Telegraph.—Sales are proving very good for Wire Nails and a better feeling is noted in prices. Makers' quotation on carload lots to jobbers is \$2, base, St. Louis, and dealers quote single cars at \$2.05. Small lots from store may be had at \$2.15, base.

Pittsburgh.—We are advised there is a good steady demand for Wire Nails, the heavy advances in prices by the American Steel & Wire Company apparently not hurting demand to any extent. An item of interest to the Wire Nail trade is that the American Steel & Wire Company have taken over the Shoenberger Steel Company and have further fortified themselves in the control of the Rod, Wire and Wire Nail trades. There has been no advance in the price of Wire Nails since February 27. We quote to large buyers in carload lots at \$1.85; to large buyers in less than carload lots, \$1.87½; to small buyers in carload lots, \$1.90; to small buyers in less than carload lots, \$2, f.o.b. Pittsburgh or Cleveland.

Cut Nails.—The advance in Wire Nails apparently stimulated the demand for Cut Nails, as an increase in orders has been apparent during the past week. The supposition on the part of the trade that the price of Cut Nails would be moved up further to a parity with that of Wire Nails may have caused the increase in demand. The present price is \$1.40 in carload lots, f.o.b. Pittsburgh.

New York.—The local demand for Cut Nails is light. New York price for carloads on dock is \$1.55; for small lots from store, \$1.65.

Chicago, by Telegraph.—The price of Cut Nails has been advanced by jobbers owing to the advance made by the mills and small lots from stock are now quoted at \$1.65.

St. Louis, by Telegraph.—No material change has occurred in Cut Nails, although they are placed at \$1.65 in small lots from store. Manufacturers are conservative, and while the industry has a very comfortable patronage there is no disposition shown to force more orders. Makers are content to realize the better prices and go with the market and not ahead of it.

Pittsburgh.—Mills report an active demand for Cut Nails and the tone of the market is strong. We quote at \$1.40, carload lots, f.o.b. Pittsburgh, and are advised that some mills are asking higher prices.

Barb Wire.—The Barb Wire market continues firm in tone. Some manufacturers are anticipating difficulty in making prompt deliveries owing to the volume of contract orders booked. Present quotations are as follows, f.o.b. Pittsburgh or Cleveland: To large buyers in carload lots, Painted, \$1.95; Galvanized, \$2.35; to small buyers in carload lots, Painted, \$2; Galvanized, \$2.40; to small buyers in less than carload lots, Painted, \$2.10; Galvanized, \$2.50.

New York.—The demand for Barb Wire has been moderate during the past week. Carload lots of Four-Point Galvanized on dock are quoted at \$2.50; small lots from store, \$2.60. Painted Wire is 40 cents less.

Chicago, by Telegraph.—The situation is maintained as in previous reports. The demand is excellent and shows

no indication of weakening. Prices are firmly maintained as follows: Carload lots of Painted Barb Wire, \$2.10, Joliet or De Kalb, and Galvanized, \$2.50, with 10 cents additional per 100 pounds for small lots. Carload lots of Plain Annealed Wire are quoted \$1.85, base, with the same advances on Galvanized and on small sizes as above. Plain Wire in even weight bundles, 50 pounds or over, is charged 5 cents extra.

St. Louis, by Telegraph.—A somewhat better action is had, and it will be a matter of but a few weeks when plenty of Barb Wire will be put into actual service. The carload price of \$2.10 for Painted, f.o.b. St. Louis, to jobbers, with 40 cents advance for Galvanized, remains. Single cars are quoted at an advance of 5 cents per 100 by jobbers. Smaller lots can be had at \$2.25 for Plain Painted.

Pittsburgh.—There is a heavy demand for Barb Wire, and the American Steel & Wire Company are refusing to quote for delivery later than March, and are making quotations only for immediate acceptance. We quote to large buyers in carload lots, Painted, \$1.95; Galvanized, \$2.35; to small buyers in carload lots, Painted, \$2; Galvanized, \$2.40; to small buyers in less than carload lots, Painted, \$2.10; Galvanized, \$2.50, f.o.b. Pittsburgh or Cleveland.

Smooth Wire.—The demand for Smooth Wire of all kinds has been particularly heavy during the past few months. The market is represented by the quotation of \$1.70, base, with 40 cents advance for Galvanized, f.o.b. Pittsburgh or Cleveland. To single carload buyers the price is \$1.75, base, f.o.b. Pittsburgh or Cleveland, and for less than carloads, \$1.85. An advance of 40 cents is made for Galvanized.

Pittsburgh.—There is a good demand, and the tone of the market is very strong. We quote \$1.70, base, with 40 cents advance for Galvanized; to single carload lot buyers the price is \$1.75, base, and for less than carloads, \$1.85. An advance of 40 cents is made for Galvanized, all f.o.b. Pittsburgh or Cleveland.

Double Pointed Tacks.—This line continues to be characterized by a strong tone, and firmer quotations are replaced by others materially higher. The goods in papers are represented by the quotation of discount 90 and 10 to 90 and 10 and 10 per cent., and in bulk by discount 80 and 10 to 80 and 10 and 10 per cent. The market, however, shows the effect of stocks purchased at the low prices recently ruling.

Poultry Netting Staples, Blind Staples, &c.—These goods continue very firm, and are held at materially higher prices than a short time ago. This is on account of the great advances which have taken place in the raw material and the agreement reached in regard to prices by the manufacturers.

Steel Brackets.—An advance has been made by the united action of the manufacturers of Wrought Steel Brackets. A discount of from 75 to 75 and 10 per cent. fairly represents the market.

Wrought Butts, Strap and T Hinges, &c.—The market in these goods has witnessed a gradual withdrawal of some of the extras which have been given beyond the base discounts, and the tone of the market is thus, especially with the large volume of business and the strength of the raw material, decidedly strong. The manufacturers, too, have been conferring and intimate that another and more open advance may take place before long.

Peter Wright Anvils.—In the midst of a market so generally advancing it is to be noted that a reduction of about $\frac{1}{2}$ cent per pound has recently been made by leading importers in the price of Peter Wright Anvils. This is on account of a concession in price on the other side.

Cabinet Locks.—An advance in the price of Cabinet Locks is announced by the manufacturers. The discount is now 33½ per cent. instead of 45 per cent. as before.

Bright Wire Goods.—In sympathy with the high prices for Wire, Bright Wire Goods are higher. They

are now represented by the quotation of discount 90 per cent., either for Iron or Brass.

Henry Disston & Sons.—The discount sheet given below has just been issued by Henry Disston & Sons, Philadelphia, as applying to their catalogue January, 1899. Attention is directed to changes made in this catalogue in list prices on Circular Saws for cutting metal, Band Saws, Nos. 12, 99, 9, 120 and 77 Hand Saws, Wood Saw Rods, Butcher Saws, Butcher Saws and Saw Knives, Butcher Saw Blades, Hack Saw Frames, Screw Drivers and Mahogany Plumbs and Levels. The discount sheet, which gives quotations on a number of goods not heretofore made by the corporation, is as follows:

	Discount. Per cent.
Inserted Tooth Circular Saws, points and holder	50
Rift Saws	50
Solid Tooth Circular Saws	50
Circular Saw repairs	50
Shingle Saws	50
Segment Veneer Saws and repairs	50
Circular Miter "	50
Concave Saws	50
Grooving " and Cork Knives	50
Circular Milling Saws for Metal	50
Screw Slotting Cutters	50
Circular Saws and Disks for hot or cold metal	50
" Slate and Comb Saws	50
Mill and Mulay Saws	50
Gang and Deal "	50
Pit, Whip and Futtock Saws	50
Pond and Hand Ice "	50
Diamond Tooth Drag "	50
Drag Saws	50
Perforated Lance Tooth	50
Electric, Tenon and Plain Tooth	50
Lumberman, Diamond, Fleam and Lancet	50
Champion and Tuttle Tooth	50
Great American	50
One-man Great American	50
" Champion and Lumberman	50
Keystone One-man Champion	50
One-man Perforated Lance Tooth	50
Repairing Mill, Mulay and X-cut Saws	50
Pacific and Oregon Tooth	50
Humboldt, California, Toledo, Sabine	50
Special V.m Champion	50
Triumph, Great American and Champion Tooth X-cut Saws	55
Aukland Pattern X-cut Saws	50
Russian " " Pit and Gang Saws	50
X-cut Saw Handles, Cleaner Tooth Gauges	50
Universal X-cut Saw Tool	25
Saw Mandrels and Speed Indicator	25
" Gummers " Cutters	25
Emery Wheel Gummer and Cutter Grinder	25
Punch Gummer and Hand Shear	25
Swages	25
X-cut Saw Setting Tool	25
Tools for repairing	25
Saw Sets, machine for sharpening inserted teeth	25
" and Side Files	25
Saw Clamp and Filing Guide	25
Star Saw Sets	25
Wire Gauges	25
Band Saws, 2 inches to 14 inches wide	60
" $\frac{1}{4}$ inch " $\frac{1}{4}$ "	70
Fay Web Saws	25
German Web Saws	25
Turning and Felloe Web Saws	25
Gin Roller and Doctor Blades	25
Hand Saws, Nos. 12, 99, 9, 16, D-100, DS, 120, 76, 77, 8	25
" Nos. 7, 107, 10 $\frac{1}{2}$	30
" Nos. 3, 1, 0, 00	30
Combination Hand Saws	30
Gauge Saws and Cabinet Scrapers	25
Compass and Keyhole Saws	25
" Keyhole, Plumbers' and Joiners' Saws	25
Pattern Makers', Dovetail, Turkish, Stairbuilders' and Climax Pruning Saws	25
Pruning "	25
Baik Saws	25
Wood " Blades	40
Framed Wood Saws and Bucks	35
Wood Saw Rods	25
Butchers' Saws and Blades	35
Dehorning "	25
Disston's Concave Ground Hack Saw Blades	25
Hack Saw Frames	30
Keystone, Flexible Back and Machine Hack Saw Blades	30
" Butcher Saws and Blades	20
Plastering Trowels	25
Brick and Pointing Trowels	30
Standard Brand "	40
Garden Trowels	40
Cane, Hedge and Corn Knives	25
Posthole Diggers	25
Pruning Hook and Saw	25
Saw Handles and Screws	25
Machinists' Rules, Squares and Gauges	25
Slaw Cutters and One and Two-knife Vegetable Cutters, Corn Grater and Turnip Shredder	40
Crout Cutters, 24 x 7, 26 x 8, 30 x 9	55
" " 36 x 12, 40 x 12	40
Try Squares and Bevels	70
Mortise Gauges	70
Screw Drivers, Handles and Ferrules	70

Plumbs and Levels	70
Trammel Points and Plumb Bobs	70
Superfine Files	30
Files and Rasps	75

Rules.—Since our last report there has been a further strengthening in the Rule market, and the old base discount of 80 per cent. has been abandoned by the leading manufacturers, who now start with discount 75 per cent. instead.

Steel Goods.—The trade are awaiting with interest definite announcement from the manufacturers in regard to the new prices on Steel Goods, as referred to in our last issue. The abandonment of the complicated system in vogue for a year or two, with the perplexing groupings, &c., will be appreciated by many.

Rivets.—A sharp advance has been made in the price of Iron Rivets, and Tinnings are now quoted in a general way at discount 70 per cent.

Market Wire, Stone Wire, &c.—There is a marked scarcity of Market Wire, Stone Wire, &c., and the trade experience some difficulty in even getting quotations. The mills are crowded with orders, and are very careful about making contracts for future delivery.

Chain.—The Chain market, as noted last week, is firm and without important advances witnesses the withdrawal of extremely low prices. Higher prices are, in fact, announced by manufacturers of Trace Chain, Fancy Chains, &c.

Cast and Malleable Fittings.—A firm tone characterizes this line, and higher prices are announced.

Carriage Bolts, Machine Bolts, &c.—Somewhat higher prices are being quoted by most of the manufacturers of Carriage Bolts, Lag Screws, Machine Bolts, &c., and the market has a firm and confident tone.

Nuts.—Advances have been made by the manufacturers of Nuts. Prices are very firm and the volume of business large.

Cordage.—Manufacturers have advanced the price of Manila and Sisal Rope 1 cent a pound, the advance taking effect March 1, as follows:

	Per pound, cents.
Manila, 7-16 inch and larger	9 $\frac{1}{4}$
" $\frac{3}{8}$ inch	9 $\frac{1}{4}$
" $\frac{1}{2}$ and 5-16 inch	10 $\frac{1}{4}$
Sisal, 7-16 inch and larger	8 $\frac{1}{4}$
" $\frac{3}{8}$ inch	8 $\frac{1}{4}$
" $\frac{1}{2}$ and 5-16 inch	9 $\frac{1}{4}$
" Lath Yarn	7 $\frac{1}{4}$

Manila Tarred Rope, 15-thread, is quoted 9 $\frac{1}{4}$ cents, as is also Manila Hay Rope, medium. The price of Jute Rope is 5 $\frac{1}{2}$ to 6 cents.

Jobbers who have Rope bought at lower figures make slight concessions in price in some instances. The advance followed the higher price of Hemp.

Binder Twine.—Advanced prices on Binder Twine, which took effect March 1, are as follows:

	Cents.
White Sisal, 500 feet to pound	8 $\frac{1}{4}$
Standard, 500 feet to pound	8 $\frac{1}{4}$
Manila, 600 feet to pound	9 $\frac{1}{4}$
Pure Manila, 650 feet to pound	10 $\frac{1}{4}$

These prices are for carload lots, f.o.b. Eastern factories. An advance of $\frac{1}{4}$ cent per pound is charged in less than carload lots.

Glass.—The demand for Window Glass from factories is reported large under the continuance of rebates to extensive buyers. The American Glass Company are represented as having more than 1,000,000 boxes now in stock and as producing 600,000 boxes a month. There is a difference of opinion in Glass circles as to whether the combine will simply withdraw the rebates May 1 or whether they will in addition advance prices. In either event they will probably devote May, which will be the last month of the fire, to the rounding out of their stock. Some jobbers are stocking the Glass bought under the present favorable conditions rather than offer concessions in price to induce purchases of carload lots. Local demand is quiet. Dealers are quoting 85 and 5 per cent. discount for less than carload lots. On carloads 85 and 15 per cent. discount is quoted, and in some cases lower fig-

ures are obtainable. There is practically no carload business and little demand for small lots. American Glass Company's prices to the regular trade are as follows:

Districts.	A.	B.	C.	D.	E.
5000 boxes or more.....	85 & 10	85 & 10	85 & 5 & 2½	85 & 10	85
Carloads.....	85	85	85 & 5 & 2½	85	85
3000 boxes or more.....	85 & 5	85 & 5	.....	.....	85 & 5 & 2½
1000 boxes or more.....	.....	.....	85 & 10 & 2½	.....	.....

These prices are subject to freight allowance.

Paris Green.—The Paris Green market has increased in strength since our last report and manufacturers are asking on the basis of 12 to 12½ cents per pound in Arsenic kegs or casks, according to the buyer, quantity, &c. The demand is moderate in volume. The following are 30-day net prices:

	Cents per pound.
Arsenic kegs or casks.....	12 to 12½
Kegs of 109 to 175 pounds.....	12½ to 13
Kits of 14, 28 and 56 "	13½ to 14
Paper boxes, 2 to 5 "	13½ to 14
" " 1 pound.....	14 to 14½
" " ½ "	15 to 15½
" " ¼ "	16 to 16½

Paints and Colors.—*White Lead, &c.*—While the past two months have developed an unusually large demand for White Lead for near and future delivery, there is a temporary lull in inquiries. The size of orders indicates a filling of immediate requirements rather than anticipating future needs. The advanced prices for White and Red Lead and Litharge in kegs noted last week continue, as follows: In lots of less than 500 pounds, 6½ cents; 500 pounds or over, 5½ to 5¾ cents.

Oils.—*Linseed Oil.*—The Linseed Oil market is considered a strong one, with the possibility of higher values later in the spring. The range of prices which has been maintained for some time is looked upon as beneficial. It is sometimes the case that Linseed Oil reaches undesirably high prices during the late winter and early spring months when demand for consumption is light and then falls off in value later in the season. The Western competition to which reference was made last week was confined to one or two carloads of Oil and had no permanent effect upon the market. Quotations remain unchanged, as follows: City Raw, 41 cents per gallon in lots of five barrels and larger, and 42 cents in lots of less than five barrels; Boiled Oil, 2 cents per gallon advance. Out of town brands are quoted at 1 cent less than the foregoing prices.

Spirits Turpentine.—The market is firm but quiet at 46½ cents for Southerns and 46¾ cents for machine made barrels. Stocks both North and South are reported as diminishing, with light receipts.

The Sportsmen's Show.

THE fifth annual sportsmen's show, which opened March 2 and excepting Sundays will continue until March 15 in the Madison Square Garden, New York, is in form a radical departure from any of its predecessors. The entire amphitheater has been reserved for depicting life in the woods, mountains and lakes, the trade exhibits all being arranged in the galleries one flight up. One of the features is a lake for water polo, swimming contests, &c., while at the east end of the Garden is a very realistic Indian village, with wigwams of bark and all the necessary accessories, including genuine Indians and guides, with some fine mountain scenery back of it to heighten the effect. In addition to various camps, &c., on the main floor are a large number of tanks with live fish, cages with wild animals such as bears, wildcats, wolves, lynx, raccoons, opossum, &c.; inclosures with buffalo, deer, elk, antelope and other wild game. In another series of inclosures will be found fish and game exhibits, showing many interesting varieties alive. There are also tournaments in pistol and rifle shooting, swimming contests, &c.

Among the hundred trade exhibits in the first tier of galleries is the handsome triumphal arch of the Union Metallic Cartridge Company, entirely new. It is made of

mahogany and brilliantly lighted by electricity. The Remington Arms Company and Bridgeport Gun Implement Company also have attractive displays of Guns, Golf Clubs and kindred articles. The Laffin & Rand Powder Company make an effective display, among other things showing sections of 8, 10 and 12 inch Navy Rifles with their projectiles. Other exhibitors are Leroy Shot & Lead Works, Schoverling, Daly & Gales, Peters Cartridge Company, Colt's Patent Firearms Mfg. Company, Tatham Bros., Parker Bros., and the United States Cartridge Company. The latter company have handsomely fitted up a large private box in Oriental style for the entertainment of their friends, and in this connection engraved invitations have been issued by their agents in this city, U. T. Hungerford Brass & Copper Company.

Henry Disston & Sons' Catalogue.

HENRY DISSTON & SONS, Philadelphia, Pa., issue an 1899 catalogue, accompanied by a discount sheet which appears in another column. Among the goods shown not previously made by the concern are included Rift Saws, Lock Corner Cutters, Hand Ice Saws, Perforated Lance One-Man Cross Cut Saw, Pacific and Oregon Tooth Cross Cut Saws, Russian pattern Cross Cut, Pit and Gang Saws, Cross Cut Saw Tool, Saw Setting Tool, D-100 Hand, Panel and Rip Saws, Adjustable Compass Saw, Compass Blades, Pattern Makers' Saw, Champion and Tuttle Tooth Wood Saw Blades, Wood Saws No. 111, Web Saw Frame, Steel Duplex and Clipper Wood Saw Rods, Corn Grater, Turnip or Potato Shredder, Cabinet Makers' Screw Driver, Shafting and Pocket Levels, &c. Attention is directed to the regulation in prices of some standard articles. The catalogue is uniform in style and binding with the ones formerly issued by the concern, but contains a larger number of pages. Besides the new articles already referred to, the catalogue is devoted to illustrations, descriptions and list prices of the goods with which the trade are familiar.

James W. McWilliams.

THE Hardware trade will be grieved to learn of the death under distressing circumstances on the 4th inst. of James W. McWilliams, of the late firm of Horton, Gilmore, McWilliams & Co., Chicago. Mr. McWilliams was run over by a train on the Chicago & Northwestern Railway at Ravenswood, Ill., which he attempted to board while moving, and died within a few hours afterward. He was 40 years of age, and leaves a wife and several children. For the past year he had been engaged in settling up the accounts of the firm, who went out of existence in the latter part of 1897. Mr. McWilliams had a most genial and lovable disposition and was a man of exemplary character, and his untimely death has brought sorrow to a very wide circle of friends and acquaintances.

A New Screw Company.

A N ACT to incorporate a new Screw company was introduced last week in the Rhode Island Legislature. The new company are to be known as the Rogers Screw Company, and will have a capital stock of \$250,000. The incorporators are Edwin G. Angell, Charles D. Rogers, Gen. Olney Arnold, Henry R. Rogers and Olney Arnold II. It is understood that this is an outcome of the recent annual meeting of the American Screw Company, when, as we have already announced, a radical change was made in the officers, those at that time retiring being active in the organization of the new company.

EDWARD W. MARTIN, treasurer of the Lalance & Grosjean Mfg. Company, New York, has retired on a pension after 29 years' service and James Cochrane, secretary of the company, has been appointed to fill the office of treasurer in addition to that of his former position.

The Knight of the Grip.

XXXI. THE BUYER OUT.



ATELY, one of the buyers went East upon his annual scouting expedition, and his absence caused a good many of the traveling men who came in to feel more or less regret. It was just after the first of the year, when the holidays were well over and the rush of inventory taking was supposed to be well done away with, and every manufacturer had his salesmen out gunning for spring business. It seemed as though three out of every five callers wanted to see this particular man.

"Mr. F. in?"

"No; he is out of town."

"Who is taking his place?"

"There is no one who would give you an order. He filled up his stocks before he left and there will be nothing bought before his return."

So ran the stereotyped conversation, with a most tiresome reiteration. Most of the men realized the futility of any further attempt to do business, but a few, principally strangers, refused to believe that there was no prospect for trade, and proceeded with their little stories with all the enthusiasm of men expecting large orders.

Wouldn't Quit.

One salesman, who had tried in vain to interest Mr. F. in a device for which there would evidently never be a great demand, insisted upon explaining its details at length and proving the buyer wrong—a most injudicious course, and one that could do him no good, while it would surely work him harm if repeated to the buyer, since there are other lines for which he usually receives orders when he calls. Another, a Hack Saw man, hunted up a stockman, and got him enthused over the merits of a new blade, and the two came back together. The salesman chopped with a steel blade at a bar to prove its indestructibility, bent in it circles to show its elasticity, produced a tube with a circular patch cut out of one side to show what it could do, handed me a little bunch of orders from retail dealers which he offered to exchange for a stock order—and stood at rest with an air of pleased expectancy that indicated that he thought there was only one thing that could result—a good order. I repeated the same old tale, and he left in evident disgust for a house that wouldn't place an order after such a demonstration.

Selling Jobbers.

Salesmen who visit the jobbers do not, as a rule, have much trouble in finding some one with whom they can do business. To the jobber, handling the large quantities of goods that he does upon the narrow margin that he can obtain, the buying is of prime importance, and he spares no pains to have a thorough equipment for caring for this part of his business, and to be in a position at all times to take advantage of any opportunity for picking up goods that may sell well, or of keeping thoroughly informed as to every feature of the market. If a buyer is to be away for more than a day or so, arrangements are made to care for anything that may transpire in his absence, so that the salesman can usually depend upon meeting some one who will listen to him and will buy if the right conditions obtain, unless, as it happened in Mr. F.'s case, the buyer is going into the market to look after his lines and the people hold aloof for fear of acting in conflict with him.

Selling Retailers.

With the jobber's salesman it is different. There are fewer men about a retailer's establishment, and when the one buyer is away for any reason, the purchasing is at a standstill until his return, and the salesman's way

is blocked so far as this particular house is concerned. And the causes that will draw a Hardwareman away from his business are all too numerous for a salesman's comfort. He has not the same reason for needing to keep closely at his desk, for while the jobber is often confined to one or two houses for his supplies on some particular line, the retailer can pass by any one salesman without uneasiness, knowing that the next man who calls will probably have practically the same lines to offer him, and at prices not greatly varying.

Play Times.

Since taking up this subject I have looked through the reports of the salesmen sent in at different periods from different sections, and they contain some interesting comments bearing upon the absence of the buyers at the time when calls were made. In three instances the buyer was away upon his wedding trip. In several others he was taking a vacation. "Away to a picnic," "Out fishing," "Squirrel hunting," "Out in the country," "In Chicago," "In the South," "Out camping," "At the ball game—Pittsburgh got whipped," say others, while in a number of instances complaints are made that everybody was away at a local fair. A Michigan salesman writes disgustedly, "I am trying to dodge the confounded county and street fairs. Just got through shying around the numerous circuses." A Virginia man says, "Everybody in this country is at Lynchburg this week attending the fair and shows." From Illinois comes the complaint, "Peoria is having a street fair, and everybody from the surrounding country is at Peoria, yet you cannot see one of the merchants."

Where Extremes Meet.

An Ohio merchant is credited with having "Gone to Wisconsin to drink Milwaukee beer," while another in Illinois, at about the same date, is said to have "Gone to take the liquor cure." Two salesmen forgot the existence of such a holiday as Labor Day, and started out only to find all stores closed. Another country merchant was reported on a December day to be at home "Butchering," a performance the importance of which only a country bred boy can realize.

Patriotism.

One report says that the buyer had "Gone to attend a reunion at Louisville;" another states that a customer is "At Buffalo—soldiers' reunion"—veterans evidently, in whose memories experiences of camp and field are treasured, and who "fight and bleed and die" for their country anew in these patriotic convocations. Our late trouble with Spain also finds mention here. A Bluffton (Ind.) buyer left hurriedly for the front, with a major's commission in his pocket, and the salesman found no one as yet ready to take his place. Other reports tell of stores being closed and whole towns being engaged in giving departing troops a rousing send off, and when Johnny came marching home again there was another break in the routine of business, and the salesman sought in vain to obtain a hearing.

In Court.

"Attending court," says one report; "At the county seat, drawn on a jury," notes another; "Juryman," laconically remarks a third. Evidently the country merchant is not up to the dodge of joining some military body as a contributing member to secure immunity from jury duty, or is too patriotic to take advantage of such a subterfuge to avoid a duty incumbent upon a good citizen.

Sickness.

The foregoing comments are culled from a large number of these reports, and for every statement giving absence of a buyer as a reason for not selling there are 50 that show the Hardwareman at his post. He is not much given to absence, and the salesman can, as a general thing, count upon finding him in. The most frequent cause given for not seeing him has not been men-

tioned as yet, "Buyer sick," and the fact that more of his lapses are caused by physical inability to be at his post than anything else proves that there is more of the ant than the grasshopper in his make up.

(To be continued.)



The Jobber's Place in Distribution of Hardware.

The following letter, which was called out by the discussion in regard to the policy of A. G. Spalding & Bros. in ignoring the jobber and going direct to the retail trade, is from a prominent manufacturer of a leading line of goods used largely by factories and machine shops:

The question of marketing the goods purchased by a manufacturer is a very puzzling subject. It seems to us that any dealer who handles a line of goods and buys in a sufficient quantity to warrant him in paying his own freight is entitled to just as good a price as any other dealer in the same article. We know from experience that the retail Hardware dealer is more anxious to secure a good price for the goods which he purchases and is

Less Liable to Cut Prices

than the jobber is. There are certain lines of goods which a retail dealer cannot, as a rule, afford to pay freight charges on, and there are other lines of goods which the consumer never would expect to buy direct from a factory.

Take, for instance, such articles as Shovels, Hoes, Rakes, Pitchforks, Brushes and a thousand things which the laboring population of the country use and usually buy one only of a kind at a time. Such articles must inevitably find their way through the jobber to the retailer. There are other lines of goods, such as those we manufacture, which are bought by consumers in very large quantities. Certain manufacturers know from year to year just what their demands will be in our line of goods, and they place their order for an entire season's supply directly with the manufacturer; and we fail to see why they are not entitled to just as good a price on such orders as the jobber is. They will not buy their goods through the jobber under any consideration. If they can get just as good a price from the jobber as they can from the manufacturer they know that the jobber is making a profit on the transaction, and they therefore prefer to deal directly with the manufacturer of such articles.

Jobbers Demoralize Prices.

For many years our experience has been that the jobbers do more toward demoralizing the prices of our line of goods than any one else. They are willing to throw away their profits on our goods in order to secure orders for other goods on which their customer is not posted, and on which they can make two or three profits. We never have heard of retail Hardware dealers pursuing this policy. One would think to read the articles in your January 5 number that the jobber was the guardian angel of the manufacturer, and that he loves the manufacturer better than a brother, and that if a manufacturer will put himself entirely into the hands of a jobber his fortune will be made beyond question.

An Annoying Practice.

For the past few years it has been very noticeable that the jobbing trade do not carry the stocks of goods that they ought to supply their trade, and the custom has grown until it is a nuisance, for jobbers sometimes order two and three times the same day small lots of goods to be shipped to their customers with the condition attached to the order that they should be delivered to the customer, such delivery charges frequently amounting to 50 per cent. of the value of the goods. The jobber takes advantage of this arrangement with the manufacturer (that the goods should be delivered to his store) to in this way impose upon the manufacturer expenses which he never calculated to meet, but rather than lose the good will of the jobber he submits to this kind of imposition as long as he can.

Why Not the Retailer Direct?

Now if a manufacturer must sell to a jobber at 10 or 15 per cent. lower than he does to a retailer for the sake of getting large orders, and then has to divide his orders up into little parcels and deliver to the jobber's customer, why is he not justified in seeking the business of the retailer direct, saving to himself the extreme discount which he has allowed the jobber, and also the price of delivery?

We are not one of those people who think that the day of the jobber is over, but we do think that the jobbers are assuming entirely too much to themselves.

There are certain lines of goods that can be distributed to advantage only through the jobbing trade, but there are other lines which can be

Distributed to Better Advantage

directly to the retailer; and as we have pointed out in the earlier part of this letter, the larger consumers of certain lines of goods all over the country are insisting more and more that they should buy such goods as they consume in large quantities from the manufacturer direct; and it has happened during the past 18 months that many large consumers in our line of goods have bought their season's supply at from 10 to 20 per cent. below the lowest jobbing prices, simply because they placed their orders for their season's supply in one order which could be quickly packed and delivered and the transaction completed.

It is a very difficult thing to draw the line on all of these points. What is one man's finished product is another man's raw material. The raw material which goes through this factory is a material which is carried in stock by the jobbing Heavy Hardware house and every retail Hardware house of any size in the country, but we could not think for a minute of placing our orders for our raw material in the hands of any retail Hardware dealer or any jobber. We must buy at the lowest factory prices, and the quantity of this material that we consume in a year warrants us in expecting that the manufacturer will make us a lower price on our material than he would make any jobber in the country. We feel that at no distant day the bulk of our product will be sold to the consumer direct, and at just as low a price as the same line of goods would be sold to the jobber.

Cash Business.

An Arkansas merchant writes as follows in regard to the cash system of doing business and explains his procedure in respect to building contracts, &c.:

We find it no difficulty to conduct a cash business and confine it to cash except in case of building contracts, and then we take the position that the bill is not in condition to present till it is filled. By this means we can handle the business to the satisfaction of all parties.

Were we doing business where we had accounts with milling or manufacturing concerns we would consider 30 days as cash.

In our opinion nothing excels the cash method of doing business, and it seems to be the coming plan.

Store Arrangement.

The Hardware Store of George Sherrill.

Some features in the arrangement of the Hardware store of George Sherrill, at Sandy Hill, N. Y., are shown in the accompanying illustrations. In Fig. 1 is shown the arrangement of cupboards, which begin

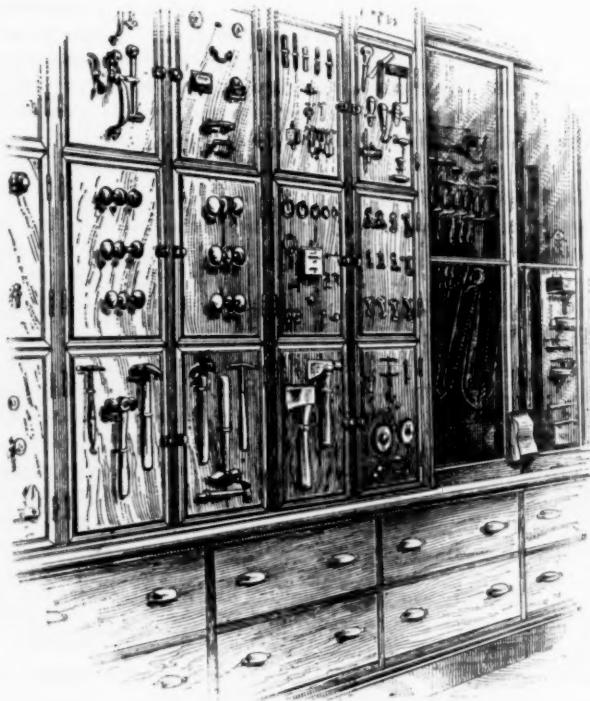


Fig. 1.—Shelf Cupboards.

at the front of the store and extend back quite a distance. By this method a large percentage of the goods carried in stock can be sampled, and the plan is found to be very convenient. The advantage of this method



Fig. 2.—Display of Tinware, &c

over that of using shelf boxes is that each class of goods can be kept by themselves with a complete stock back of the samples and protected from dust. The samples are put on with wire sample holders, thus enabling the sales-

man to remove samples at pleasure. The cupboards extend to the ceiling, the upper ones being reached by a trolley ladder, which runs the whole length of the store.

Next to the cupboards is a wall case for Tools, illus-



Fig. 3.—Plumbing, Heating and Tin Shop.

trated in Fig. 1. This is arranged in an attractive manner, and is, we are advised, productive of a satisfactory sale of Carpenter Tools. In front of the cupboards and wall case is a counter partially occupied by showcases. Extending back from the wall case is open shelving, supported by small turned supports, containing small articles of Tinware and House Furnishing Goods, Fig. 2. On the opposite side of the store are shelves and hooks for the display of Tinware, &c., which has proved attractive. This provides space underneath for Ranges, Baskets, Garden Tools, &c.

The store and stock room for Stoves, Refrigerators, Screen Doors, Farming Tools, &c., is on the second floor, and occupies the entire space.

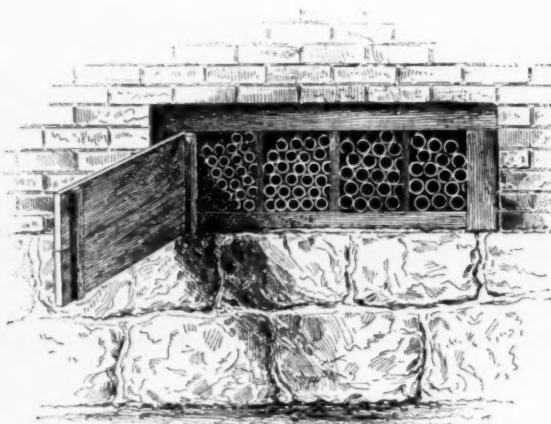


Fig. 4.—Wrought Iron Pipe Racks.

The plumbing, heating and tin shop, on the ground floor directly back of the store, is well lighted and ample for stock of all kinds, being 26 x 24 feet in size. A plan of it is shown in Fig. 3. The benches and tools are distributed around the sides of the room to provide space in which to handle large jobs such as blower pipe, &c. The stock of Tin Plate, Copper, &c., is kept under the benches on shelves and racks. A rack for Stove Pipe, Elbows, &c., is built over the Sheet Iron rack. A large door opens upon the driveway.

In Fig. 4 is shown a very ingenious as well as convenient plan for keeping Wrought Iron Pipe. This is made by boarding up under the floor timbers, thus affording receptacles for various sizes of Pipe, each by itself. The distance between the timbers is 15 inches, thus making bins $1\frac{1}{4}$ x 24 feet. As many of these bins are in use as there are sizes of Pipe carried in stock, the expense of building being the cost of the flooring and doors. The bins open upon the driveway. The basement is used for storing Wooden and Willow Ware, Pumps, Sinks, Hydrants, Nails, &c.

An elevator centrally located enables articles to be conveyed from the stock room to the cellar with but little lifting and lugger. As shown in Fig. 5, one end of the supporting chain runs over a pulley on the outside of the building, in the driveway, so as to unload from a wagon such articles as are too heavy to move by hand. The chain runs from the elevator over and around a

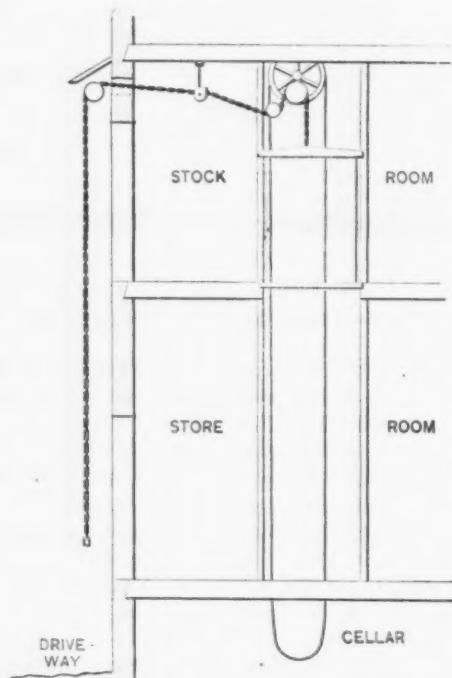


Fig. 5.—Arrangement of Elevator.

drum, then under an idle pulley, through a hay fork pulley, for support, and thence out of doors.

All the Stove business is handled on the second floor, except samples, which are displayed on the floor below. The arrangement of elevator permits taking a Stove from a wagon to the second floor, where it is polished. Then it is put on a truck and let down to the floor below on the elevator without lifting by hand but once, and that to set it on its base. The same is as true of loading as of unloading.

Sidney Shepard & Co.'s New York House.

Sidney Shepard & Co., proprietors of the Buffalo Stamping Works, Buffalo, N. Y., are now stocking up their large and commodious premises at 21 Cliff street, New York, with a full and complete assortment of the extensive line of their own manufactures, as well as a full line of tin plates, metals and all kinds of tinsmiths' supplies. This new departure will undoubtedly prove a great convenience to buyers of this class in goods, especially in view of the exceptionally complete line carried. The manufacturers have a new illustrated catalogue in press which will be sent to their customers and friends in about 30 days. The business of this well known house was established in 1836, and their branches now cover the entire country, under the styles of Sidney

Shepard & Co., Buffalo and New York, and C. Sidney Shepard & Co., Chicago, St. Louis, Kansas City, Denver and Seattle.

Requests for Catalogues, Quotations, &c.

THE entire stock, buildings, warehouse and electric and heating plant of the Turner Hardware Company, Muskogee, I. T., were destroyed by fire on the 23d ult. The loss is estimated at \$150,000, three-fourths insured. The company advise us that they will continue in the wholesale and retail business and shall be pleased to have manufacturers send them catalogues, price-lists, &c.

E. E. Gard, Fremont City, Ohio, wholesale and retail dealer in grain, feed, lumber, coal, &c., advises us that he will put in a line of Hardware as soon as his wareroom for this purpose is completed, which he expects will be about April 1. Mr. Gard is desirous of getting circulars, quotations, &c., from the trade.

J. O. Myers & Co., Gosport, Ind., have dissolved and A. H. Burkert is successor at the old stand. Mr. Burkert handles Hardware, Stoves, Tinware, Buggies, Wagons, Harness, Pumps, Rope and Twine, lumber, &c., and states that he would like to have his name placed on the mailing list of manufacturers in these lines. He buys and sells for cash.

G. C. Heyde has bought out his brother's interest in the firm of Heyde & Bro., Marion, Ill. Mr. Heyde would appreciate copies of catalogues, price-lists, &c., relating to Hardware, Stoves and House Furnishing Goods from manufacturers and wholesalers.

Homer F. Livermore, 85 and 87 Pearl street, Boston, manufacturer of Castings, desires copies of catalogues of Hardware Specialties as well as price-lists of Bolts, Nuts, Washers and Screws.

George W. Church.

GEORGE W. CHURCH, 183 Greenwich street, New York, is negotiating with several well known manufacturers of Machinists' and Mechanics' Tools and Supplies with a view to representing them in New York and adjacent suburban territory, and is desirous of supplementing the line by the addition of a few more accounts. Mr. Church began business with his uncle, Peter A. Frasse, in 1865 at the old store 95 Fulton street, which was established about 1812, and after 11 years with the old house he became managing partner in the firm of Montgomery & Co. and subsequently of Church & Sleight until 1896, when he continued the latter business in his own name. In March, 1898, he removed to 183 Greenwich street, but answering the President's call for troops in April he went out with the First New Jersey Regiment, with which he had been connected in various capacities for 17 years, at the time of the call being on the colonel's staff as quartermaster. His business, deprived of its head, went into a receivership, hence this determination to represent manufacturers in a line he has been prominently identified with for 33 years.

Trade Items.

CLINTON WIRE CLOTH COMPANY, 76 Beekman street, New York, are issuing an illustrated blotter circular, envelope size, $6 \times 3\frac{1}{2}$ inches, handsomely printed in colors on one side. These blotters will be furnished in suitable quantities to the trade with the customer's imprint.

HUGH A. COLE of the Cole Mfg. Company, Chicago, is East on a business trip in the interest of Cole's Hot Blast Stoves and Air Tight Heaters. The company are intending to put on the market for the fall season the Cole Slow Combustion Stove, for which special advantages are claimed.

SCHOVERLING, DALY & GALES, 325 Broadway, New York, are offering to the trade a line of moderate priced Bicycle Bells manufactured by Middletown Bell Company, Middletown, Conn., whose product they control.

MILLERS FALLS COMPANY, 93 Reade street, New York, in an advertisement on another page make an announcement in regard to their Star Hack Saw Blades, which will be of interest to the trade. It refers to the matter of substitution and explains how the Star goods may be obtained and recognized.

TROY NICKEL WORKS, Troy, N. Y., are sending out to the trade a perpetual calendar for desk use. The calendar is designed to remind the trade of the Alaska Stove Trimmings, which are also referred to as perpetual.

Price-Lists, Circulars, &c.

REMINGTON ARMS COMPANY, Ilion, N. Y.: Remington Standard Bicycles.

IDEAL TOOL COMPANY, Indianapolis, Ind.: Cement Working Tools.

HARBER BROTHERS COMPANY, Bloomington, Ill.: Catalogues relating to Vehicles, Farm Machinery and Wagons, &c.

T. H. CRANSTON & Co., 58 Wabash avenue, Chicago: Bicycle Sundries for which they are manufacturers' selling agents.

KNAPP & SPENCER COMPANY, Sioux City, Iowa: Bicycles and Sundries.

LASAR-LETZIG MFG. COMPANY, formerly Excelsior Wire & Iron Company, St. Louis, Mo.: More than a score of sheets presenting half-tone illustrations of their Metal Work.

H. L. JUDD & Co., 87 and 89 Chambers street, New York: No. 37 catalogue, 176 pages, devoted to Upholstery Hardware, Curtain Poles, Display Fixtures, &c.

THE WELLS & NELLEGAR COMPANY, Chicago: Seasonable goods, Tools, Guns, Builders' Hardware, &c.

THE GOULDS MFG. COMPANY, Seneca Falls, N. Y.: Illustrated catalogue entitled "How to Spray, When to Spray, and What Pumps to Use."

PATTERSON, GOTTFRIED & HUNTER, 146-150 Centre street, New York: Reeves' Wood Pulleys and other Shafting Specialties.

BUTTS & ORDWAY COMPANY, Boston, Mass.: Bicycles from \$75 to \$85 list.

DETROIT SPROCKET CHAIN COMPANY, Detroit, Mich.: General catalogue No. 3.

MONARCH CYCLE MFG. COMPANY, Chicago: Monarch and Defiance Bicycles.

THE CHALLENGE CORN PLANTER COMPANY, Grand Haven, Mich.: Fourteenth annual catalogue and price-list of the Challenge Iceberg Refrigerators, Sideboards and Ice Chests.

HENLEY BICYCLE & ROLLER SKATE WORKS, Richmond, Ind.: Henley Bicycles and Roller Skates.

AUBURN WAGON COMPANY, Martinsburg, W. Va.: The Auburn Steel Axle Wagons.

Among the Hardware Trade.

The Chicago retail merchants in all branches of trade are working vigorously to weaken the power of the big department stores in that city. A permanent organization of the retailers was effected on the evening of the 1st inst. at the Great Northern Hotel and 20 organizers were put to work to get additional members. The number of retail dealers in Chicago is estimated at 50,000, and with their clerks will aggregate 125,000. The association will first get every dealer and all their clerks to agree to buy goods out of their own lines only from members of the organization, and will next endeavor to fight the department stores in the State Legislature and in the City Council.

A Western merchant retiring from the Hardware business makes the following facetious announcement in regard to the matter:

GUERNSEY, IOWA, February 13, 1899.

After 18 years of merchandising in Iowa—four years at Milo and 14 years at Guernsey—I have concluded to try farming. I have sold my entire business to W. H. Davidson, who will continue at the old stand. I bespeak for him the same kind consideration that I have received in the past, and I hereby thank the commercial world for allowing me to withdraw of my own free will.

I remain yours with a good appetite and a clear conscience,
H. C. FICHT.

At the annual meeting of the Albany Hardware & Iron Company, Albany, N. Y., March 6, the following officers were re-elected: President, Chas. H. Turner; treasurer, Jas. K. Dunscomb; secretary, Wm. B. Wackerhagen.

Clarksville Hardware Company, Clarksville, Mo., have been incorporated with a capital stock of \$3000.

D. W. Smyser has lately opened up for himself in the wholesale and retail business at Dillsburg, Pa., handling Shelf and Heavy Hardware and Sporting Goods. Mr. Smyser was formerly a member of the firm of Nesbitt, Smyser & Co. of that place.

E. Y. Hawley has succeeded W. A. Hawley & Son, Northboro, Iowa.

The Smith & Peyton Hardware Company, Belton, Texas, have been incorporated with a capital stock of \$40,000. The incorporators are W. McB. Smith, Frank Corbin and Lee Peyton. The company are a combination of the interests of Smith & Corbin and Peyton & Co.

T. E. Morgan is successor to Geo. McCrea at Drayton, N. Dak.

F. L. Stephenson is now conducting the business at Yates Center, Kan., formerly carried on by Stephenson & Rankin, who dissolved. Mr. Stephenson has built a new warehouse, 25 x 45 feet, and states that he is now in excellent position to take care of the large spring business anticipated.

B. W. Roe & Co. have succeeded F. C. H. Adams at Stamford, Neb. The capacity of the establishment has recently been doubled.

Chas. E. Hammond is now owner of the Hardware and Implement business of the Sherman Implement Company, Sherman, Texas, which continues with unchanged style.

Clarence Johnson is successor to Duncan & Shaw in the Hardware business at John Day, Ore.

The Hardware store of F. R. Chown, Portland, Ore., was recently damaged by fire and water to the extent of several thousand dollars. The loss was fully covered by insurance.

Hocker & Whitford have succeeded Parr & Hocker at Guilford, Mo.

Aug. Young, Fulda, Minn., has admitted a partner and the style is now Young & Hyslop.

The warehouse of Hardware Merchant Frank T. McNitt, Centralia, Wash., collapsed a short time since. Mr. McNitt is rebuilding.

Brown, Piper & Co., Winnemucca, Nev., were dissolved on the 11th ult. and have been succeeded by C. B. Brown & Co., comprising Mr. Brown of the old firm and his two brothers. The firm have more than doubled the size of their store and largely increased their stock.

R. B. Griffith has purchased the Hardware stock of Hall & Gallup at Grand Forks, N. Dak.

A. F. Brady and Don J. Robinson recently embarked in the Hardware business at Grass Valley, Cal., under the style of Brady & Robinson. Their stock comprises Shelf and Heavy Hardware, Stoves and Tinware and Agricultural Implements.

The store of G. A. Utter, Bucoda, Wash., was destroyed by fire a short time since.

Spear & Beringer, Cochranton, Pa., have dissolved partnership, and the business is now conducted under the style of the D. Beringer Hardware Company.

M. L. Bigelow is successor to Wm. H. DeCamara, De Land, Fla.

The Lewisburg Hardware & Machine Company have been organized at Lewisburg, Tenn.

Lewis L. Pughe and C. S. Cook have entered the Hardware business at Oxford, N. Y., under the style of Cook & Pughe. Their line comprises Hardware, Stoves, Tinware, Agricultural Implements, Plumbing, &c.

D. A. Rimes has succeeded Milton Harris at Winthrop, Ark.

Chas. Lansdell has sold out his stock of Hardware at Welumpka, Ala., to Smith, Gamble & Howle.

Buchtel, Franck & Co. are successors to Empey & Sanders, Tobias, Neb. The new firm are making a general overhauling of the store and will install new fixtures, &c., for the more convenient accommodation of stock.

The firm of Schnur & Solem, Fingal, N. Dak., have dissolved, Thorger K. Solem retiring. Mr. Schnur will continue at the old stand.

Samuel Bredahl has added a tin shop to his Hardware store at Powhatan, Kan.

Glasford Implement Company are a new firm at Glasford, Ill. They are handling Shelf Hardware, Stoves, Wagons, Buggies, &c., in addition to a line of Agricultural Implements.

Loeffler & Weaver have succeeded H. H. Loeffler at Armour, S. Dak.

Clarence A. King is successor to King & Nash at Norwich, N. Y. Mr. King handles Hardware, Plumbing and Heating Goods, &c., and also manufactures the Rex Acetylene Apparatus.

Ben W. Whitney is expecting to open up shortly in the Hardware business at Galva, Kan.

H. F. Hoesman has sold out his Hardware and Implement business at Ellsworth, Kan., to Elred & O'Donnell.

Lehman Hardware & Implement Company, Newton, Kan., have been making a number of improvements in their establishment, with a view to increasing its capacity and convenience. They also have a branch house at Shawnee, Okla. T., where they have lately completed a new iron warehouse.

Whitelaw & Sons have succeeded John Whitelaw in the Hardware and lumber business at Kidder, Mo.

D. Zigrang has purchased the Hardware and Harness business of Henry S. Stone at Livermore, Iowa. Mr. Stone succeeded Zigrang & Hines about a year ago.

Robert & Rex have sold out their Hardware store at Ossian, Ind., and the business is now conducted by F. M. Thurber.

W. C. Braley, Kellogg, Iowa, dealer in Hardware, Stoves, Sporting Goods, &c., will add Furniture to his line, for the accommodation of which he is erecting a building 22 x 46 feet in dimensions.

James C. Richards has succeeded Richards & Williams in the Hardware business at Farmer City, Ill.

S. F. Travis & Co. have succeeded Edward Stiling in the wholesale and retail Hardware business at Cocoa, Fla.

Eaton & Sutfin are successors to Chas. Stewart at Robinson, Ill.

The interests of French, Long & Co. and John Davis' Sons at Sullivan, Ind., have been consolidated under the style of Long, Warren & Co.

The Hardware store of F. E. Woolley, Roodhouse, Ill., was recently destroyed by fire. Mr. Woolley carried a stock valued at \$6000.

E. B. Rorick & Co. have succeeded H. E. Green & Co. at Morenci, Mich.

Sunset Hardware Company have been incorporated to engage in business at Dallas, Texas. Capital stock is \$5000.

J. C. Foster has purchased the wholesale and retail business of M. R. Manhard & Co., Newberry, Mich. The style will continue unchanged.

W. H. Stark & Co. are successors to Heaton & Clark at Central City, Iowa.

E. Granthaim has disposed of his Hardware business at Reachdale, Ind., to B. F. Harrison, formerly in the same line at Lewisville, Ill.

P. A. Heaton has succeeded J. E. Knapton at Central City, Iowa.

Hand & Trout, Maquoketa, Iowa, have dissolved partnership and J. B. Trout is continuing under his own name.

Stellwagen & Kynoch, St. Ignace, Mich., have enlarged their store.

Schumaker & Hurlburt, Gibsonburg, Ohio, have sold out their business to Abe Blank of Napoleon, Ohio, who will continue at the old stand. N. M. Brinkerhoff, who has been with the old firm since the business was started, will continue with Mr. Blank as general manager.

The Hardware establishment of Dobbins & Ewing, Columbia, Tenn., was destroyed by fire a short time since. Loss, \$30,000; insurance, \$13,500; salvage, \$4000. The firm are now erecting a three-story structure, 40 x 106 feet, which will be equipped with all the modern Hardware store improvements.

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Hollingsworth & Dowdle have succeeded Riggins & Hollingsworth at Graham, Texas.

T. P. Morton & Co., Bellevue, Mich., have been succeeded by H. M. Weed.

Geo. A. Rubelmann Hardware Company, 905-907 North Sixth street, St. Louis, Mo., issue a series of three catalogues, aggregating 472 pages, in which are shown Cabinet, Store Fixture, Shade and Carpet Hardware and Upholsterers' Supplies. Machinists' Tools and a miscellaneous assortment of Tools for wood workers. The first book has 155 pages and is known as Catalogue No. 15. Machinists' Tools are given in Catalogue No. 7, 125 pages, and Carpenters' Tools in Catalogue No. 5, 192 pages.

A corporation has been formed under the name of How Brothers & Co., under the laws of Minnesota, to conduct a Hardware business at Sauk Centre, Minn. The capital stock of the corporation is \$50,000. The persons associated in forming this corporation are as follows: B. W. How, Mary T. How, W. F. Perry and W. A. Barto of Sauk Centre, and Dawes How of Crookston. B. W. How and Mary T. How have been in business at Sauk Centre for 12 years under the name of How Bros. & Co., and now incorporate their establishment, which will be continued as before.

George A. Gray, Oldtown, Maine, has built a large addition to his Hardware store, has entirely refinished and remodeled the interior, and now has one of the most modern stores in the State.

The store of J. W. Corman & Co., Brooksville, Fla., was damaged by fire on the 31st ult., to the extent of \$1200 or \$1400. The firm are intending to rebuild.

The building and stock of Root & Brainard, Mantua, Ohio, were completely destroyed by fire a short time since. H. W. Brainard is expecting to continue the business.

C. E. Sweet has succeeded Sweet & Bloom in the Hardware and Agricultural Implement business at Concordia, Kan. Mr. Sweet has added a Harness department.

W. H. Clasby has succeeded Stuart & Clasby at Savannah, Mo.

J. R. Humphries, Georgetown, Texas, has been succeeded by Humphries & Peterson.

D. Winternitz, Las Vegas, N. M., has sold out his Hardware stock to Ludwig William Ilfeld, who will continue at the old stand.

F. R. Logan & Co. have recently entered business at Atlanta, Ga., as dealers in Hardware, &c.

F. L. Anderson has succeeded James P. Clag & Son at Webster City, Iowa, handling Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, Buggies, Wagons, &c.

C. Van Deventer, Berryville, Va., has disposed of his Hardware business.

The senior member of the Hardware firm of Bramblett & Brother, Forsyth, Ga., died on the 4th ult. The business will continue under the same firm name, Mr. Bramblett's widow retaining his interest.

T. J. Eberlee has succeeded Nichols & Eberlee at Cattaraugus, N. Y.

John Difenderfer and William Thomas have entered into partnership in the Hardware business at Jones, Mich., under the style of Thomas & Difenderfer.

The store of G. A. Utter, Bucoda, Wash., was recently destroyed by fire. Insurance amounted to \$1100.

L. G. Mattison has purchased Frank Garlock's business at Newark, N. Y., which was established more than 40 years ago.

T. N. Baker & Son, Albany, Texas, have dissolved and T. N. Baker is now conducting the business under his own name.

In consequence of the large increase in their Hardware business Whitney Company, Albuquerque, N. M., who are successors to Albuquerque Mercantile Company and Whitney Hardware Company, have decided to sell out their Furniture, Carpet, Queensware and Glassware

departments and devote their entire time and attention to wholesale and retail Hardware and wholesale Crockery. The company have rented the premises next to their present store on First street, formerly occupied by Mandell Bros. in the Hardware line, which will give them a total frontage of 75 feet and place their business practically under one roof, which is advantageous not only from the standpoint of comfort and convenience, but secures a considerable reduction in expenses.

R. W. Smith, son of H. L. Smith, has become a member of the wholesale and retail firm of Barnard, Smith & Co., Jackson, Mich.

Miscellaneous Notes.

Remington Bicycles.

The Remington Arms Company, Ilion, N. Y., and 313-315 Broadway, New York, are this year offering two pairs of bicycles for men and women and a pair of juvenile wheels for young people. Their highest grade wheels, listing \$50, models 56 and 51, are described as follows: The forks are of heavier tubing than the frame (the neck tube in all models being of extra heavy tubing). The fork crown is oval and drop forged; lower head cone detachable; upper and lower rear frame tubes elliptical in shape and without the usual bend to give clearance for tire, thus enhancing the beauty of the frame. The front and rear sprockets are detachable and interchangeable. The crank shaft is of drop forged construction, in one piece with the cranks. The sprockets have double teeth and are designed especially for the Remington special chain. The seat post is held in the frame without the use of binding bolts or internal expanders, this device consisting of a knurled wedge, fastened loosely in the seat mast tube of the frame and so arranged that the greater the weight placed on the saddle the more secure becomes the fastening. A moderate upward blow with the hand will allow the seat post to be lifted out or readjusted.

Bigelow Wire Fly Killer.

J. F. Bigelow, Worcester, Mass., patentee and manufacturer of the Bigelow wire fly killer, in offering this article for the season of 1899 advises us that it is now in the hands of many hardware dealers, to whom he furnishes a display hanger for window advertising. The device, it is stated, kills but does not crush the fly, and the manufacturer claims that the insect can be killed on the most delicate tinted walls or paper without soiling. It is made of fine spring steel plated wire, and is recommended for use in residences, hotels, offices, and is especially desirable for sick rooms, sanitaria and hospitals. The length of the fly killer is 16 inches and they are packed in boxes of one dozen each.

Red Jacket Brass Lined Cylinder.

The Red Jacket Mfg. Company, Davenport, Iowa, are calling special attention to the Red Jacket brass lined cylinder to be used in pumping in connection with a $1\frac{1}{4}$ inch pipe. In this cylinder the strength of steel is combined with the smoothly polished surface of a heavy brass seamless drawn tube, making the most durable and the cheapest cylinder for any well. The caps are malleable iron, and will, therefore, not break even if very roughly used. They are screwed to the tube with a taper thread, making a perfect joint without the need of leathers or rubber packing rings. A two-leather all brass plunger is used with a brass and rubber poppet valve. The lower poppet valve is solid brass and rubber and works on a brass seat. This cylinder is made in sizes of 2 to $3\frac{1}{2}$ inches, and from 12 to 18 inches in length.

Milwaukee Hay Tool Company.

The Milwaukee Hay Tool Company, Milwaukee, Wis., make a specialty of appliances for loading and unloading hay which they illustrate in a large four-page circular. In it are shown a variety of grapple hay forks, tackle, track carriers, wagon slings and other apparatus designed for this class of work.

B. & R. Bicycle Lamp.

Schoverling, Daly & Gales, 325 Broadway, New York, are marketing the B. & R. acetylene gas lamp, here shown. Water is introduced by removing the screw cap at the back above, communicating with the reservoir, and the flow is regulated by a notched indicator moved by the top center cap. The positive character of this regulator is such, it is stated, that a proper adjustment can be made in the dark. A $2\frac{1}{2}$ -inch lens is held in position by a flat

spring catch, so the lens can be quickly removed. Ordinary carbide may be used, the material being held in the lower portion, which also contains a false bottom so made that the residuum can be instantly lifted out. The bracket



B. & R. Acetylene Gas Lamp.

can be attached to the head or either fork. The lamp weighs 15 ounces, and is finished in nickel.

Nickelized Padlock.

The Slavemaker-Barry Company, Connellsburg, Pa., John H. Graham & Co., 113 Chambers street, New York, general sales agents, are making the padlock, No. 550, here shown. The case, of extra heavy iron, is polished and heavily nickelized, the spring shackle is self locking and the



Fig. 1.—Nickelized Iron Padlock.



Fig. 2.—Flat Steel Key for Lock.

key cylinder is made of brass. There are two flat steel keys to each lock, the locks being put up in half dozens, 30 dozen in a case.

White's Universal Door Key.

The White Mfg. Company, Ithaca, N. Y., are making White's universal door key, shown herewith. Fig. 1 represents it about half size, there being two tinned iron

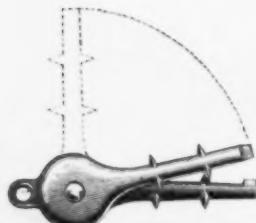


Fig. 1.—White's Universal Door Key.

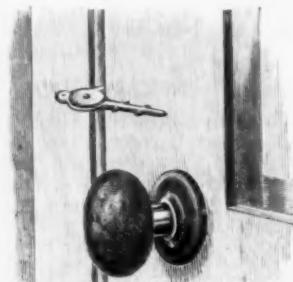


Fig. 2.—The Key in Position.

keys pivoted together so that a complete turn can be made. Upon each lever are four teeth. To lock a door the keys are turned at right angles with each other, as indicated by the dotted lines in Fig. 1, when the shank of one

lever is inserted between door and jamb, the remaining key being used as a lever to give the inserted key a quarter turn, which sets two of the teeth into the door and two into the jamb, locking the door, as seen in Fig. 2. The manufacturers refer to the fact that the imprint of the thin teeth is scarcely noticeable, except when the door is particularly close fitting, when the key can be used either at the bottom or top. This device is also designed

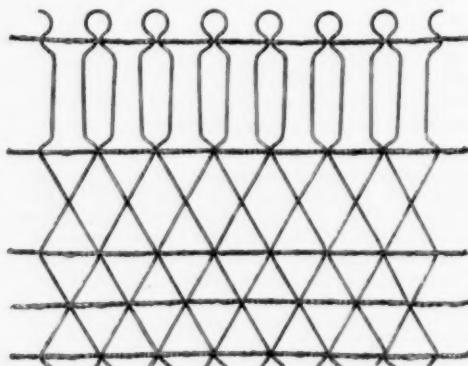


Fig. 1.—Section of Fence.

for locking transom and other windows, either open or shut in the latter case. It is recommended particularly for tourists, cyclers and other travelers.

The Dwiggins Wire Fence.

Illustrations are herewith given of the wire fence and fence fasteners which have recently been put on the market by the Dwiggins Wire Fence Company, Anderson, Ind. Fig. 1 is a representation of a short section of the

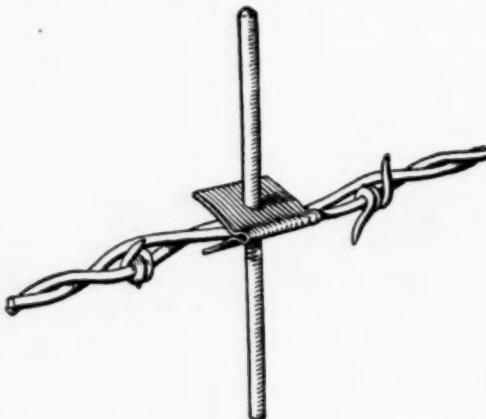


Fig. 2.—Grip Fastener in Connection with Barb Wire.

fence. The pickets are made of No. 9 galvanized steel. The horizontal wires are made of two No. 12 galvanized steel wires twisted together. The 28-inch fabric has five, the 35-inch fabric has six and the 43-inch fabric has seven horizontal wires. Figs. 2 and 3 show the grip fastener, which is intended for the use of farmers who desire to build their own fences. It is claimed for this fastener that it securely locks any size of wire from No. 6 to 12,

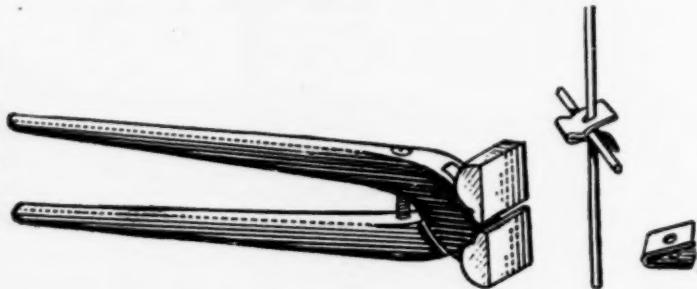
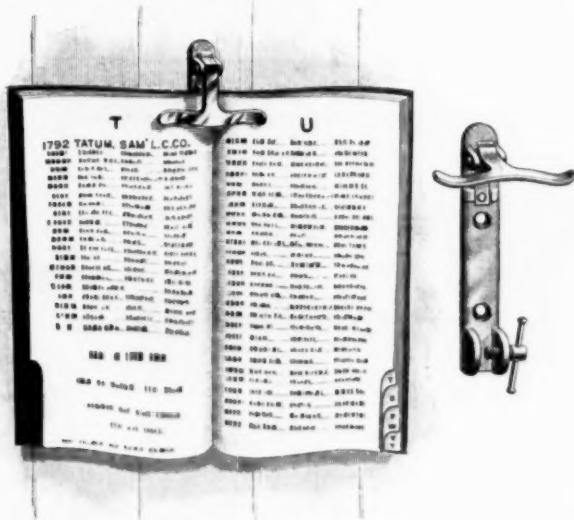


Fig. 3.—Fastener Used with Other Fencing.

and that barb wire is held perfectly firm. Old, plain or barb wire fences, it is pointed out, may be repaired by the use of an upright stay and these fasteners.

Tatum's Telephone Book Holder.

The Sam'l C. Tatum Company, Cincinnati, Ohio, are manufacturing Tatum's telephone book holder, as here illustrated. It is a convenience for telephone users, by means of which a telephone directory is held permanently in an upright position, so the pages can be readily turned, and then by turning down the spring clamp held



Tatum's Telephone Book Holder.

open at any desired place. Two sizes in nickel plate are made, No. 1 for books up to $\frac{1}{2}$ inch thick and No. 3 for books not over $1\frac{1}{2}$ inches in thickness.

Tyler's Wire Specialties.

The Wm. E. Pratt Mfg. Company, 89 Lake street, Chicago, are putting on the market some wire specialties, which are herewith illustrated, and in which, it will be observed, the same principles of construction are employed. Fig. 1 is Tyler's spring bird cage hook. This

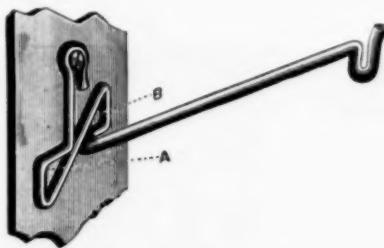


Fig. 1.—Tyler's Spring Bird Cage Hook.

hook is intended to take the place of the old cast hook and coil spring. The twist of the wire running around to form loops A and B makes the spring. This is made of the best cold drawn steel wire and cannot be broken in



Fig. 2.—Tyler's Letter or Bill File.

using it for the purpose designed. It is sold at about the same price as the cast hook, thus saving the price of the coil spring. Fig. 2 illustrates Tyler's letter or bill file. This is made of a single piece of cold drawn steel wire and

the loops formed in the wire make a flat base to hold the file in a straight position. This file has no soldering to work loose by the spring of the wire.

Baker Curry Comb Specialties.

Illustrations are herewith presented of two styles of curry combs made by the L. B. Baker Mfg. Company, Racine Junction, Wis. Fig. 1 is the Hunter toothless curry comb, in which the corrugation of a curved bar gives a modified tooth action without any of the usual harshness

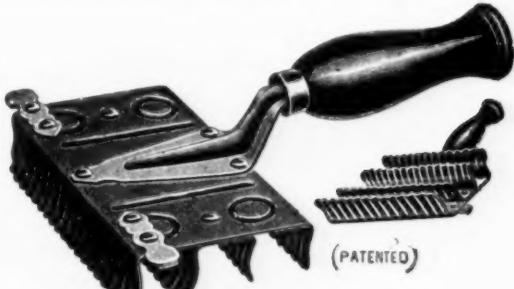


Fig. 1.—Hunter Toothless Curry Comb.

and is claimed to clean a horse cleaner than combs with teeth. The bar made in this way has a wavy edge, but no sharp points. This curry comb is referred to as a particularly valuable device when used as a shedder, for cleaning mud from legs and as a sweat scraper. It is self cleansing. Being entirely made of the best sheet steel it will stand great abuse. Fig. 2 is an illustration of the class of toothed combs made by this company, the particular comb shown being their No. 102, a six bar shingle back, very heavy and strong, for severe usage. A rib is placed on each side of the rivets, the shank passes through

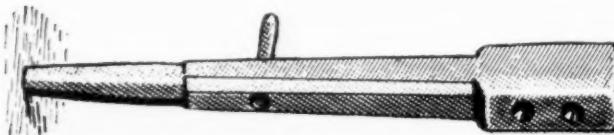


Fig. 2.—Shingle Back Curry Comb.

the handle and is riveted on, and in every other respect care is taken to secure a most substantial comb. The same style of comb is also made with seven or eight bars and finished in either lacquer or tin or made of solid brass. The Hunter toothless comb is made in the same variety of finishes.

Combined Rivet Set and Punch.

George B. Swan, Mattoon, Ill., is marketing a combined rivet set and punch, as here shown. In this tool are combined a solid punch, saddlers' punch and rivet set,

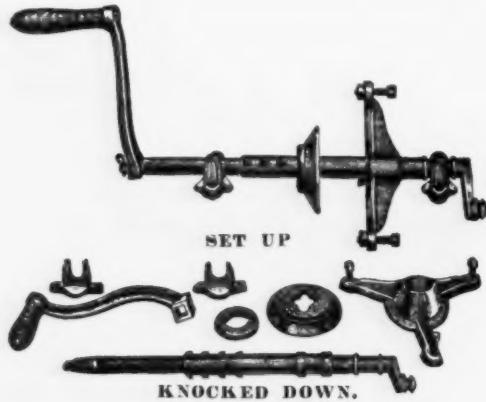


Combined Rivet Set and Punch.

designed especially for users of all kinds of belting, although equally handy for farmers and others having harness, &c., to mend. It is said to be made of a high grade of steel and will be sold at a moderate price.

The Giant Grindstone Hanger.

The Stowell Mfg. & Foundry Company, South Milwaukee, Wis., have just brought out the Giant grindstone hanger, which is herewith illustrated, the cuts showing the hanger set up and the various parts as knocked down. The statement is made that with this hanger the stone is held true and fast without either wedging or centering. The weight per dozen of these hangers is 80 pounds. They



The Giant Grindstone Hanger.

are packed half a dozen in a box. One size is adapted to all grindstones. The manufacturers state that this hanger is not an experiment, but has proved to be a thorough success.

Yankee Trousers Rack.

The Yankee Trousers Rack Company, 78-80 Broad street, New York, are offering the Yankee trousers rack here illustrated. The outer dimensions of the frame are

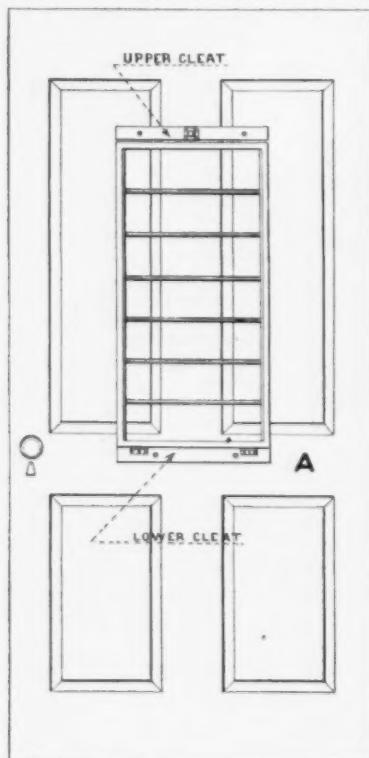


Fig. 1.—Yankee Trousers Rack in Place.

26 x 14 inches, with 11 spaces 2 inches apart for removable rungs on which to hang trousers after being properly folded, so the original creases will be preserved. This device is made of sycamore in natural finish, so as to show the beautiful grain of the wood, although, to order, any of the woods such as oak, ash, walnut, mahogany, &c., can be furnished to match any specific trim. Fig. 1 shows the position of the rack on the inner side of a closet door, it being hinged at the bottom so as to drop at right angles when putting in or removing trousers, side chains

sustaining it when down and a spring catch at the top when up. Reference is made to the fact that this convenience occupies space seldom used. It is recommended for hotels, bachelors' apartments, colleges, &c., as well. Clothiers and tailors will be furnished with larger sizes



Fig. 2.—Trousers Rack Open.

on order. It is arranged for 11 rungs, although as originally sent out six rungs are supplied, the extra rungs being sent if so ordered.

Marshall Wells Hardware Company, Duluth, Minn., are sending out two half tone pictures, one of which pre-



Fig. 3.—Trousers Rack Closed.

sents a view of the interior of their general office, 50 x 75 feet, and the other of their spacious warehouses. The company refer to the excellence of their location with its fine railroad and water communication.

Hammocks with Trapeze Suspension.

I. E. Palmer, Middletown, Conn., is introducing Palmer's Utopia and Arawana hammocks, with trapeze

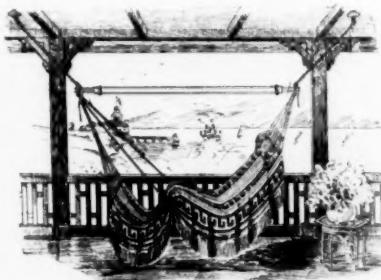


Fig. 1.—Palmer's Utopia Hammock with Trapeze Suspension.

suspension, as illustrated in Figs. 1 and 2 respectively. Fig. 1 shows a Utopia hammock slung from a trapeze, ad-

justed to its maximum contraction as regards its suspension from the ceiling. Fig. 2 represents the Arawana style, also slung from a trapeze, adjusted to its maximum extension as regards its suspension from the ceiling. The especial feature of the trapeze suspension is its peculiar

tomer, kind of merchandise sold, cash received on account, and cash paid out and what for. There is in connection with the entry chamber an attachment that will not allow the operator to forget to make entry. That is, the recorder will not work, the drawer will not open, if the operator neglects to make the record. On the left of the desk top is a small metal door, which lifts up and in opening rings a gong. Under this is a bill sticker, on which is filed each credit sale as soon as charged, leaving no chance for it to be lost or forgotten. In the top of the cabinet is an opening, the upper portion of which is covered with glass, immediately under which runs a continuous strip of paper from a roll, on which can be recorded sales, disbursements and other cash transactions. The construction is such that it is impossible to open the cash drawer until the entry made has passed into the inspection chamber; in fact, it is necessary to make the cash entry in the presence of the customer before money can be deposited or taken from the drawer. In connection with the entry chamber is an aluminum plate on which the hand rests when making a record. The weight of the hand depresses it slightly, thereby unlocking the mechanism, which allows the combination to work, and so reminds the operator to make his entry. When a sale is made the amount is written with a pencil on the underlying paper.

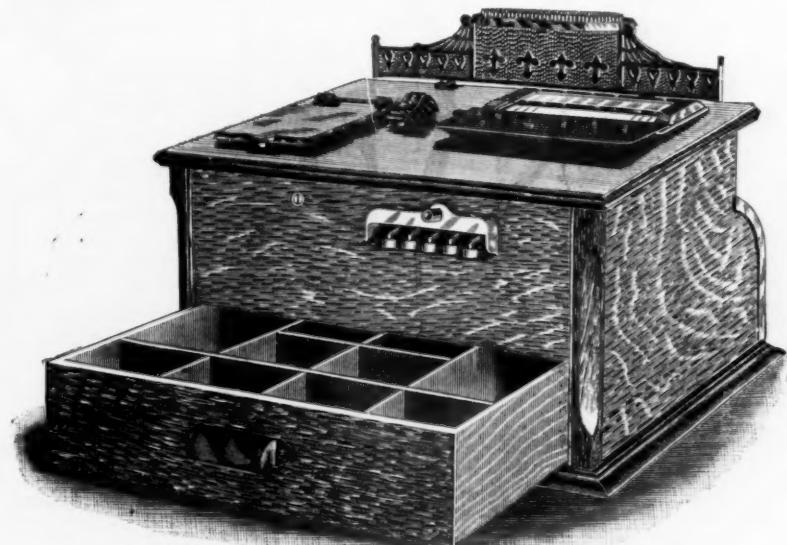


Fig. 1.—Security Cash Recorder.

justed to its maximum contraction as regards its suspension from the ceiling. Fig. 2 represents the Arawana style, also slung from a trapeze, adjusted to its maximum extension as regards its suspension from the ceiling. The especial feature of the trapeze suspension is its peculiar

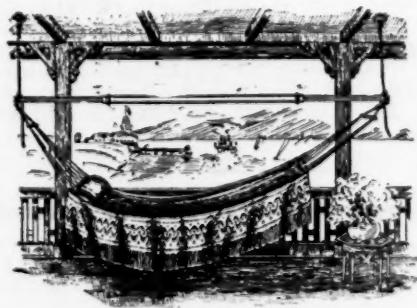


Fig. 2.—Palmer's Arawana Hammock with Trapeze Suspension.

adaptation to veranda use, it being adjustable to different sizes of hammocks within its scope (6 feet 3 inches to 11 feet), and to giving different degrees of dip and heights of suspension. A great variety of swinging motions are obtained with little effort.

Security Cash Recorder.

Hough Cash Recorder Company, Indian Orchard, Mass., are the manufacturers of a comprehensive line of Security cash recorders, one of which in an intermediate grade is here shown. What is claimed for the Security recorder is that a merchant can get a detailed and accurate record of the day's business as follows: Amount of cash sales, number of clerk making sale, name of cus-

through the opening for that purpose. The proper combination then being pressed, the lock releases the drawer, sounds the alarm and quickly throws the sale just made where it can be seen but not tampered with, and leaves a blank space for entering the next transaction. Attention is called to the fact that only those in possession of the combination can use the recorder. The cash drawer is protected by a five key combination lock, so arranged that numerous changes can be made without delay if necessary. There is also an alarm which rings continuously if other than the proper keys are touched, while but a single stroke is given if the combination is properly worked. The machine here shown is of polished wood, 17½ inches wide, 19 inches deep and 10½ inches high, has both stop action and credit devices and is designed for

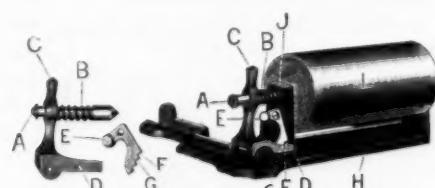


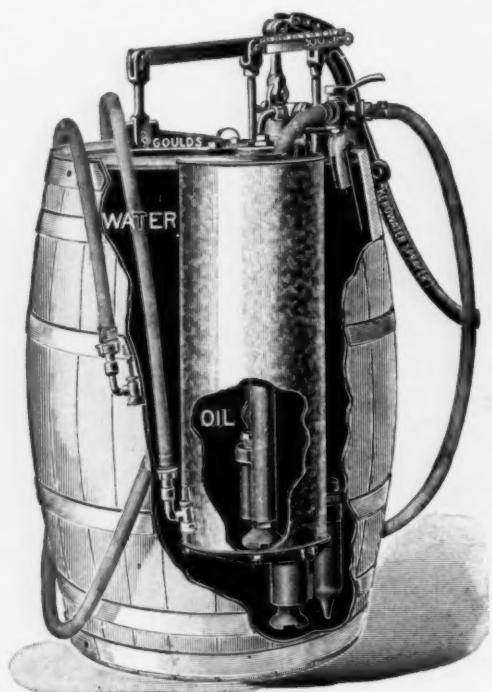
Fig. 2.—Mechanism for Operating Paper Roll.

paper 6½ inches wide. The drawer, running on rolls, has six coin spaces and four compartments for bills. The supplies are one cover, ten duplicating pads and two rolls of record paper.

Sledge & Barkley, dealers in Hardware, Vehicles, Harness, Agricultural and Farming Implements, Nails, &c., at Lawrenceville, Va., have just purchased a lot and commenced the erection of a storage warehouse 30 x 90 feet. They hope to have it ready for use by March 15.

Goulds' Kerowater Sprayer.

The Goulds Mfg. Company, Seneca Falls, N. Y., and 16 Murray street, New York, are making, in addition to a large line of pumps and spraying devices, what is known as Goulds' kerowater sprayer, for emulsifying and spraying kerosene and water. It is a combination of their Fruital spray pump, with an auxiliary pump for oil, an inner tank for kerosene and a barrel for water. The oil pump is contained within the oil tank, which partly surrounds the water pump. Both pumps and the oil tank are contained within the barrel. The point is made that instead of mixing the oil and water at the suction, which cannot be accurately controlled, the emulsion is made at the discharge. There are two pumps, one for oil and one for water, each independent of the other, but operated by a common lever. Kerosene is poured into the oil tank through a marked filling hole and water into the barrel. By operating the lever an emulsion is produced, which can



Goulds' Kerowater Sprayer.

be applied where and when required. The emulsion is always ready so long as the tanks are supplied. The amount of oil used is controlled by the proportionate stroke of the pumps. In the end of the lever are drilled a number of holes, into one of which is inserted a coupling pin. By changing this pin from one set of holes to another the percentage of oil is varied from 5 to 25 per cent. at the will of the operator. Near each hole in the lever is cast a figure which designates the exact percentage of oil that the pump working with pin in that hole will supply. Thus the action of the sprayer is direct and the resultant mixture made uniform. When so ordered an agitator at slight extra cost can be sent, which, being attached to the water pump after it has been removed from the tank and disconnected from the oil pump, will make a sprayer suitable for use with Bordeaux mixture, &c.

Metal Head Floor Scraper.

The Osborn Mfg. Company, 50 High street, Cleveland, Ohio, are making a metal head floor scraper or squilgee, as here shown. The head is made of steel and malleable

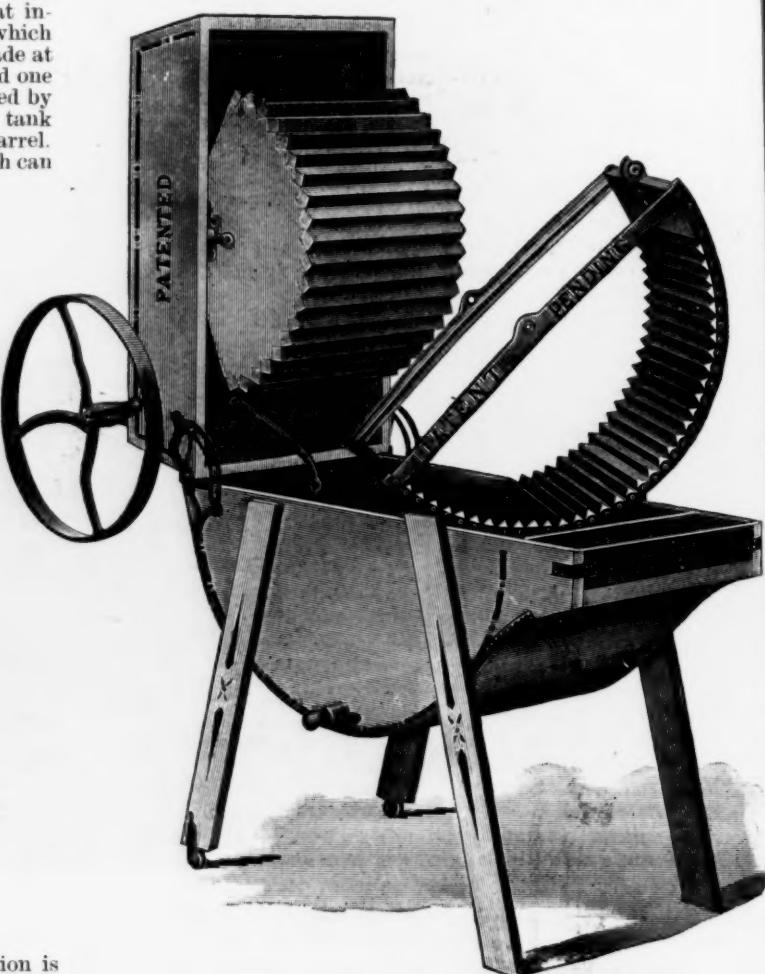


Metal Head Floor Scraper or Squilgee.

iron, neatly japanned, and the rubber of good quality and extra heavy is securely fastened with bolts. Extra rubbers cut to size and with holes for bolts are also furnished. The scraper is referred to by the manufacturers as neater and less clumsy than similar articles made of wood, and is so constructed that new rubbers can be quickly inserted.

Boss Washing Machine.

Boss Washing Machine Company, 308-310 West Pearl street, Cincinnati, Ohio, have added to their line of washing machines the Boss steel frame cylinder double acting washer here illustrated. The steel frame lower cylinder is one of several improvements recently brought out, and insures a larger tub or clothes receptacle, allowing a $2\frac{1}{2}$ -inch greater space in width than in some of the other machines, although not outwardly increasing the size.

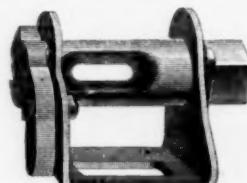


Boss Washing Machine with Steel Frame Cylinder.

This feature permits a better circulation of water through the clothes, cleansing them more thoroughly and in less time. Another improvement concerns the lid in the cover, by means of which hot water may be added without raising the entire cover. There are also pressure springs in the cover which force the upper rubber down on the clothes, with much better results. Three sizes are made, family size, No. 3; large size, No. 4 and one still larger, No. 6, for hotels and boarding houses.

Buckeye Steel Frame Fence Ratchet.

Buckeye Ratchet Company, Cleveland, Ohio, are manufacturing the Buckeye steel frame fence ratchet here illus-



Buckeye Steel Frame Fence Ratchet.

trated. The device is designed for stretching fence wire taut, so it can be securely stapled to posts. It automatically locks at every turn. The frame is stamped out of No. 14 gauge steel plate, which is referred to by the manufacturers as much stronger than cast iron, not breakable when nailing and at the same time lighter and lower in price.

Current Hardware Prices.

MARCH 8, 1899.

NOTE.—The quotations given below represent Current Hardware Prices, whether made by manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail Hardware merchants. Very small orders and broken packages often command higher prices, while lower prices are often given to larger buyers.

The character @ is used to indicate a range of price: thus discount 50 & 10 @ 50 & 10 & 5%, signifies that the goods in question are sold at prices ranging from 50 & 10% to 50 & 10 & 5%.

Many of the lists referred to in the following quotations are given in *The Iron Age* Standard Hardware Lists (price 50 cents). On many other articles, however, the different manufacturers have their own lists, which they will send to the trade on application. In the advertising columns will be found the announcements of manufacturers of nearly all kinds of Hardware, who will be pleased to furnish the trade information in regard to their goods and prices.

March, 1899.—In the present condition of the market many advances are being announced by manufacturers, but in some cases lower prices are made by the whole sale trade who have stocks on hand purchased at former quotations.

Adjusters Blind—

Domestic, 2 doz. \$3.00-\$3.33-\$3.67-\$105
North's.

Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent. 40¢
Taplin's Perfection. 45¢

Ammunition—See Caps, Cartridges, Shells, &c.

Anti-Rattlers—

Burton's No. 1. \$2 doz. pr. \$1.00
Burton's No. 2. \$2 doz. pr. \$0.75

Fernald's, Wire. \$2 doz. pr. \$0.75

Anvils—American—

Eagle Anvils, 2 d. 74¢-\$74¢

Hay-Budden, Wrought. 84¢-\$84¢

Horseshoe brand, Wrought. 94¢-\$94¢

Samson, 2 d. 74¢-\$74¢

Trenton, Wrought. 74¢-\$74¢

Imported—

Armitage's Mouse Hole. 84¢-\$94¢

Solid Swedish Steel. 10¢-\$10¢

Peter Wright's. 94¢-\$94¢

Anvil, Vise and Drill—

Miller Falls Co., \$18.00. 20¢

Apple Parers—See Parers, Apples, &c.

Augers and Bits—

Common Double Spur. 75 & 10 @ 80%

Boring Machine Augers. 75 & 10 @ 80%

Car Bits, 12-in. twist. 60 & 10 @ 10 @ 70 & 10%

Jennings' Pattern Car Bits. 60 & 60 @ 10%

Jennings' Pattern Auger Bits. 70 & 10 @ 75 & 5%

Adams Art Auger Bit. 30¢

Cincinnati Bell Hangers' Bits. 40¢

Ford's Auger and Car Bits. 40 & 10 @ 40 & 10 & 10%

Forstner Pat. Auger Bits. 25¢

C. E. Jennings' & Co.: No. 10 ext. lip. R. Jennings' list. 40 @ 40 & 10%

No. 30, R. Jennings' List. 50 & 10 @ 60 & 10%

Russell Jennings'. 25 & 10 @ 25%

L'Hommedieu Car Bits 15 & 10 @ 15 & 10 & 5%

Pugh's Jennings' Pattern. 20¢

Wright's Jennings' Bits (R. Jennings' list). 35¢

Bit Stock Drills—

Standard List. 60 & 10 @ 60 & 10 @ 10%

Cincinnati, for metal. 50 & 5 @ 50 & 10%

Syracuse, for wood. 40¢

W. & B. Wood Boring Brace Drills. 40¢

Expansive Bits—

Clark's small, \$18; large, \$28.

50¢-\$50 & 10%

Lavigne's Clark's Pattern, No. 1. 2¢

doz. 22¢; No. 2, \$18. 50¢-\$50 & 10%

Steer's No. 1, \$26; No. 2, \$18. 40 @ 40 & 10%

Swan's. 40 @ 40 & 10%

Gimlet Bits—

Common Double Cut. \$2.75-\$3.25

German Pattern. \$1.50-\$5.00

Double Cut, makers' lists. 50¢-\$50 & 10%

See also Gimlets.

Hollow Augers—

Bonney's Adjustable. \$16.00

Cincinnati Adjustable. 25 & 10%

Cincinnati Standard. 25 & 10%

Douglas'. 33¢-\$33-\$34 & 10%

Stearns' Common, No. 6. 10%

Stearns', all other numbers. 20 & 10%

Ship Augers and Bits—

Ford's. 40 & 10 @ 40 & 10 @ 10%

L'Hommedieu's. 15 & 10 @ 15 & 10 & 10%

Watrous'. 40 & 40 @ 10%

Awl Hafts, See Hafts, Awl.

Awls—

Brad Awls: Handled. 2 gr. \$3.00 @ 3.25

Unhandled, Shouldered. 2 gr. 65 @ 70¢

Unhandled, Patent. 2 gr. 70 @ 75¢

Peg Awls: Unhandled, Patent. 2 gr. 33 @ 35¢

Unhandled, Shouldered. 2 gr. 65 @ 70¢

Scratch Awls: Handled, Common. 2 gr. 25 @ 3.75

Handled, Socket. 2 gr. \$1.00 @ 12.00

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

First quality, best brands. \$5.00-\$5.25

First quality, other brands. \$4.25-\$4.75

Jobbers' Special Brands, good quality. \$4.00-\$4.75

Cheap Handled Axes. 4.75 @ 5.25

Beveled, add 25¢ \$ doz.

Axle Grease—See Grease, Axle.

Axes—Iron, Steel.

Concord, loose collar. 4¢-\$6

Concord, solid collar. 5¢-\$6

No. 1 Common. 3¢-\$6

No. 14 Common, New Style. 4¢-\$6

No. 2, Solid Collar. 4¢-\$6

Nos. 7, 8, 11 to 14. 50¢-\$10 & 10%

Nos. 15 to 22. 50¢

Nos. 19 to 22. 70¢

Balances—Sash—

Caldwell low list. 30¢

Vanderbilt. 30¢

Spring—

Spring Balance. 50 & 10 @ 60%

No. 2000. 20 30

Chatillon, 2 d. 70 1.50

Chatillon Straight Balances. 50¢

Chatillon Circular Balances. 80¢

Barb Wire—See Wire, Barb.

Bars—Crow—

Steel Crowbars, 10 to 40 d. 2 d 2¢-\$2 1/4¢

Beams, Scale—

Scale Beams, List Jan. 12, '82. 50 & 10%

Chatillon's No. 1. 40¢

Chatillon's No. 2. 50 & 10 @ 50 & 10 & 5%

Beaters—Egg—

New Dover (Dover Stamping Co.).

2 d. 75¢ \$ gr. \$7.50

Dover, Ex. Family size. 2 d. 75¢ \$ gr. \$7.50

New Dover. 2 d. 75¢ \$ gr. \$7.50

Dover (Standard Co.), No. 10. 2 d. 75¢

\$5.50 No. 5. 36¢ No. 15. 12¢

Dover (Taplin Pat. Imp.), No. 100. 2 d. 70¢

gro. \$7.00 No. 150. 2 d. 70¢

Lebanon. 2 d. 75¢ \$3.00

Spiral. 2 d. 75¢ \$4.25-\$4.50

Standard Lyon. 2 d. 75¢ \$1.75; 3 d. 75¢ \$5.00

Wonder (S. S. & Co.). 2 d. 75¢

Belows—

Blacksmith—

Standard List. 70 & 10 @ 70 & 5%

Often sold at net prices:

Inch. 30 32 34 36 38 40

Each. \$3.75 4.00 4.75 5.25 6.00 7.00

Extra Length:

Each. \$4.50 5.00 5.50 6.25 7.00 8.50

Molders—

Blacksmith—

Standard List. 70 & 10 @ 70 & 5%

Often sold at net prices:

Inch. 10 11 12 14 16

Per doz. \$8.00 6.50 7.75 8.75 11.00 13.25

Hand—

Inch. 6 7 8 9 10 12

Per doz. \$3.25 3.50 3.75 4.50 5.25 6.00

Bells—Cow—

Wrought, Sheep and Cow. 60 & 10 @ 70 & 5%

Kentucky. 75 & 10%

Western. 70 & 10%

Texas Star. 75 & 10%

Door—

Gong, Yankee. 60 & 10%

Lever, R. & E. Mfg. Co.'s. 60 & 10%

Lever and Pull, Sargent's. 45 & 10 @ 45 & 10 & 5%

Hand—

Hand Bells, Polished. 70 & 10 @ 70 & 5%

White Metal. 70 & 10 @ 70 & 5%

Nickel Plated. 60 & 10 @ 60 & 5%

Swiss. 70 & 10%

Silver Chime. 40 & 10 @ 50 & 5%

Miscellaneous—

Farm Bells. 2 d. 2¢

Steel Alloy Church and School. 50 & 10%

Tire—

Tire. Common, list Feb. 28, '82. 70 & 10 @ 75 & 5%

American Screw Company:

Norway Phila., list Oct. 18, '84. 74 & 10 @ 75 & 5%

Eagle Phila., list Oct. 16, '84. 80 & 10 @ 85 & 5%

Bay State, list Feb. 28, '83. 70 & 10 @ 75 & 5%

Franklin Moore Co.:

Norway Phila., list Oct. 16, '84. 74 & 10 @ 75 & 5%

Eagle Phila., list Oct. 16, '84. 80 & 10 @ 85 & 5%

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Heavy Hammers and Sledges—							
2 lb and under.	2 lb 45¢						
3 to 5 lb.	2 lb 36¢	80	10	20			
Over 5 lb.	2 lb 30¢	10	10	25			
Wilkinson's Smiths	9 1/2¢	10	20	20			

Handcuffs and Leg Irons
See Police Goods.

Handles—

Cross-Cut Saw Handles—

Atkins'.....40¢
Champion.....45¢@45¢@10%
Ely's Perfection.....2¢ doz. \$3.00

Iron, Wrought or Cast—

Barn Door, 2¢ doz. \$1.40.....20¢@5%
Bronze Iron Drop Latches, 2¢ doz. 60¢
Chest, Sargent's List, 50¢@50¢@10%
Door or Thumb:

Nos.	0	1	2	3	4
2¢ doz.	\$0.90	1.00	1.08	1.35	1.50
	60¢@10%@60¢@70%				

Jap'd Store Door Handles—Nuts, \$1.62;
Plate, \$1.10; no plate, 80¢.88.....10%
Roggan's Latches, 2¢ doz. 28¢@30¢

Wood—							
Auger, assorted	2¢ gr.	\$2.25¢	2¢@2.50				
Auger, large	2¢ gr.	\$2.75¢	2¢@3.00				
File, assorted	2¢ gr.	\$1.25¢	2¢@1.40				
Brad Awl	2¢ gr.	\$1.75¢	2¢@2.00				
Apple Firmer Chisel, ass'd	2¢ gr.	2.25¢	2.50				
Apple Firmer Chisel, large	2¢ gr.	2.75¢	3.00				
Hickory Firmer Chisel, ass'd	2¢ gr.	2.25¢	2.50				
Hickory Firmer Chisel, large	2¢ gr.	2.50¢	2.75				
Socket Firmer Chisel, ass'd	2¢ gr.	2.50¢	2.75				
Socket Framing Chisel	2¢ gr.	2.50¢	2.75				
Hammer, Hatchet, Axe, &c.	50¢@10%						
Hoe, Kake and Fork,	60¢@10%@60¢@10% Shovel and Spade, Wood D' H'dle,	60¢@10%					
Hand Saw, Varnished, 2¢ doz. 75¢@80¢;							
not V orn'd head		55¢@60¢					
Plane Handles:							
Jack, 2¢ doz. 23¢@25¢; Jack Bolted...		55¢@60¢					
Fore, 2¢ doz. 35¢@38¢; Fore, Bolted...		70¢@75¢					

Hangers—							
Barn Door, New Pattern, Round Groove, Regular:							
Inch.....3	4	5	6	8			
2¢ doz.	\$1.28	1.68	2.16	2.64	3.30		
Barn Door, New England Pattern, Check Back, round Groove, R' gular:							
Inch.....3	4	5	6				
2¢ doz.	\$2.86	3.74	4.84	6.16			
Bigelow & Dowse Co.:							
Paragon, No. 1, \$3.50; No. 2, \$4.50; No. 3, \$5.50	2¢ doz.						
Chicago Spring Butt Co.:							
Friction.....35¢@35%@10%							
Oscillating.....35¢@35%@10%							
Big Twin.....35¢@35%@10%							
Chisholm & Moore Mfg. Co.:							
Advance.....60¢@10%							
Cleveland.....60¢@10%							
Baggage Car Door.....50¢							
Elevator.....40¢							
Railroad.....55¢							
Cronk hanger 'o':							
Roller Bearing.....70¢							
Steel Covered.....60¢@10%							
Lane Bros.:							
Parlor, Standard.....40¢@10%							
Barn Door, Standard.....60¢@10%							
Covered.....60¢@10%							
Cycle, 2¢ doz. \$12.00.....33¢@5%							
No. 50.....60¢@5%							
Parlor Door, New Model.....40¢@5%							
Lawrence Bros.:							
Ornate.....60¢@10%							
New York.....60¢@10%@60¢@10%							
Sterling.....60¢@10%							
McKinney Mfg. Co.:							
No. 2, Standard, \$1.8.....60¢@10%							
No. 1, Special, \$1.3.....60¢@10%							
Payson Mfg. Co.:							
Pendulum, No. 533.....\$2.49							
E. C. Stearns & Co.:							
Davis Parlor Door.....50¢@50% Gem Parlor Sliding Door.....50¢@10%							
Challenge.....50¢@50% Steel Single Track Parlor, 80.....50¢							
Royal Parlor Door.....50¢							
Warner's Pat. ....20¢@10% Warner's Imp'd Single.....40¢@10%							
Stowell Mfg. and Foundry Co.:							
Badger.....60¢@1%							
Baggage Car Door.....33¢@5%							
Climax Anti-Friction.....55¢@5%							
Elevator.....40¢							
Interstate.....60@15%							
Magic.....50@10%							
Matchless.....60@10%							
Nansen.....60@10%							
Parlor Door.....50@10%							
Railroad.....55@5%							
Street Car Door.....50@10%							
Steel, Nos. 300, 400, 500.....45@5%							
Wild West.....50@5%							
Zenith for Wood Track.....55@5%							
Taylor Boggis Foundry Co.:							
Kidder's.....50@50@10%							
Terry Mfg. Co.:							
Modern.....70¢							
Modern, Covered.....70¢							
Safety.....70¢							
Shield.....70¢							
Solid.....70¢							
Wrought.....70¢							
Van Wagoner & Williams Hdw Co.:							
American Trackless.....33¢@10%							
Wilcox Mfg. Co.:							
Aurora Steel Endless.....69¢							
Bike Roller Bearing.....60@10@11%							
Bike Steel Endless.....50@10@10%							
C. J. Roller Bearing.....60@10@10%							
Cycle Ball Bearing.....0@10%							
Dye Steel.....60@10%							
Economical Single Track.....50@10@5%							
L. T. Roller Bearing.....70¢							
New Era.....50@10%							
New Richards.....60¢							
O. K. Roller Bearing.....70¢							
Prindle Improved.....60@10%							
Richards' Improved.....60@10%							
Richards' Single Track.....50@10%							
Wilcox Dwarf Roller Bearing.....40@10%							
Wilcox-ives.....60@10%							
Wilcox Tandem Roller Bearing.....80@10%							
Wilcox Trolley Ball Bearing.....40@10%							
Wilcox Trolley Roller Bearing.....50%							
Wilcox Trolley Roller Bearing, Fire.....40@10%							
Wood Track.....60¢							

Harness Menders—See Menders.**Harness Snaps—See Snaps.****Hasps—**McKinney's Perfect Hasp, 2¢ doz. \$1.10
40@10%

Wrought Hasps, Staples, &c.—See Wrought Goods.

Hatchets—

Blood's, Hunt's, Plumb's, Underhill's, etc., 40@12¢@50@5%

Cheaper Brands.....50@10@60%

Hay and Straw Knives—

See Knives.

Hinges—

Clark Mfg. Co.:

No. 1 Blind Hinge, Old Pattern, "Special,"

No. 1 Blind Hinge, "Diamond" (with tip)

No. 1 Blind Hinge "Cottage" (with tip)

No. 1, 2, 3, 5 Blind Hinges, regular

No. 1, 2, 3, 5 Blind Hinges, "Victor"

No. 50 Blind Hinge, both "Noiseless" and "Empire"

No. 50 Blind Hinge, "Bird Cage," 10¢@

No. 50, 60, 65 Blind

Lull & Porter Old Style Shutter, 80@10%

Dixie, L. & P. Shutter.....80@10%

Buffalo Reverse Shutter.....80@10%

Mortise Gravity Blind.....50¢

Huffer.....50@10@10@60%

Parker.....75@10@75@10@5%

North's Automatic Blind Fixtures, No. 2, for Wood, \$9.00; No. 3, for Brick, \$11.50

Reading Gravity.....75@10@10@

Sargent's, Nos. 1, 3, 5, 11, 13, 75@10@5%

Wrightsville H'dware Co.:

Acme, Lull & Porter.....80@10%

Buffalo Gravity Locking, Nos. 1, 3 and 5

Champion Gravity Locking, No. 75

1868, Old Pat'n, Nos. 1, 3 & 5, 80@10%

Tip Pattern, Nos. 1, 3 & 5, 80@10@5%

Double Locking, Nos. 20 and 25.....75¢

Empire, Nos. 101 and 103.....75¢

Niagara Gravity Locking, Nos. 1 and 3

80@10@5%

Noiseless, Nos. 50, 60, 65 and 55.....80¢

O. S. Lull & Porter.....80@10@5%

Pioneer, Nos. 060, 45 and 5%.....75¢

Steamboat Gravity Locking, No. 10.....80@10@5%

Stanley's Steel Gravity Blind Hinges, 2¢ doz. sets \$1.30.....40@10%

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Door Locks, Latches, &c.—

[Net prices are very often made on these goods.]

Plate.....\$34.45

Reading.....60&10@10%

R. & E. Mfg. Co.....60&10@70%

Sargent & Co.....60&10@60&10%

S. B. & Co., Locks, Knobs, &c. 40&5%

Elevator—

Stowell's.....83.45

Padlocks—

Wrought Iron, list Dec. 3, '97. 75&10@80%

Dog Collar, S. B. Co.40%

E. T. Fraim :

- Cast Iron, Scandinavian.....90&40%
- Mat. Iron, 120 line.....90&10%
- Mat. Iron, 110 and 125 line.....65%
- All others.....50&5%
- Scandinavian.....90&40@90&40@10%
- S. B. & Co.40%

Sash, &c.—

Fitch's Patent.....70&10%

Ives' Patent.....66&6@2%

Payson's Perfect.....70%

Payson's Signal.....70&10%

Reading.....60&10@10@70%

Machines—

Boring—

Without Augers.

Upright.Angular.

Boss, Carpenters' \$3.50

Boss, Ship Builders' 3.75

Douglas2.50 \$3.00

Jennings'2.50 3.00

Millers' Falls5.75

Snell's, Rice's Pat. 2.50 2.75

Fluting—

Crown Jewel, 6 in.\$9.50@2.75

Hoisting—

Moore's Anti-Friction Differential Pulley Block.....30%

Moore's Hand Hoist, with Lock Brake. 20%

Maris & Beckley (Teal Patent).....30%

See also Blocks.

Washing—

Wayne American, No. 2, \$27.50

Western Star, No. 2, \$27.50

Western Star, No. 3, \$30.00

St. Louis, No. 41, \$6.00) 65.00)

Carload lots 10% off, freight allowed.

Mallets—

Hickory.....50@50&10%

Lignumvitae.....50@50&10%

Tinners', Hickory and Applewood.....50@50@60%

Fiber Head, Stearns'.....25%

Mattocks—

List Feb. 23, 1899.70&10@75%

Measures—

Peck and Half Peck, See Ware, Standard and Fiber.

Meat Cutters—

See Cutters, Meat.

Menders—

Centaur Harness Menders, \$ per doz. \$6.00

Jones' Hose Menders, \$ per doz. 1/4 in. 40¢

1/4 in., 50¢; 1 in., 85¢

Victor Complete Hose Menders, \$ per doz. \$3.50

25¢

Milk Cans—See Cans, Milk.

Mills—Coffee—

Box and Side, List, Jan. 1, '88.60&10@60@10@10%

Net prices are often made on some goods, which are lower than above discount.

Enterprise Mfg. Co., list Jan. 1, '93. 30%

National, list Jan. 1, '94. 30%

Parker's Columbia and Victor. 50@2.10%

Parker's Upright. 30&10@40%

Swift, Lane Bros. 33@45%

Mincing Knives—

See Knives, Mincing.

Molasses Gates—

See Gates, Molasses.

Money Drawers—

See Drawers, Money.

Mowers, Lawn—

Net prices are very frequently quoted

10	12	14	16-inch
Cheap.....\$1.05	\$1.70	\$1.75	\$1.80
Medium.....2.50	2.75	3.00	3.25
High Grade. 3.50	3.75	4.00	4.25
Pennsylvania and Continental 60&10@10%			

Philadelphia :

All Styles except A and E.70&10%

Style A, all Steel.60&10%

Style E, Low Wheel.....40&10%

Style E, High Wheel.....50&10%

Racing.....60&10@10%

Muzzles—

Safety.....\$ gr. \$12.00@12.50

Nails—

Cut and Wire. See Trade Report.

Wire Nails and Brads, Papered, List, May 1, '92.S. e Trade Report.

Hungarian, Finishing, Upholsterers', &c. See Tacks.

Horse—

Nos. 6	7	8	9	10
25¢	23¢	23¢	21¢	21¢

40&10@2.5%	40&10@2.5%	40&10@2.5%	40&10@2.5%	40&10@2.5%
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American.....9¢	9¢	9¢	9¢	9¢
.....net				

Usable.....25¢	23¢	23¢	21¢	21¢
.....40&10@10%	40&10@10%	40&10@10%	40&10@10%	40&10@10%

Capewell.....19¢	18¢	17¢	16¢	16¢
.....10@10@5%	10@10@5%	10@10@5%	10@10@5%	10@10@5%

C. K. ....25¢	23¢	23¢	21¢	21¢
.....40&5@2.5%	40&5@2.5%	40&5@2.5%	40&5@2.5%	40&5@2.5%

Champlain.....28¢	26¢	26¢	24¢	24¢
.....40&5@2.5%	40&5@2.5%	40&5@2.5%	40&5@2.5%	40&5@2.5%

Clinton Fin. ....19¢	17¢	16¢	15¢	15¢
.....10@10@5%	10@10@5%	10@10@5%	10@10@5%	10@10@5%

Maud S. ....25¢	23¢	23¢	21¢	21¢
.....50@10@5%	50@10@5%	50@10@5%	50@10@5%	50@10@5%

Neponset.....23¢	21¢	20¢	19¢	18¢
.....40@5@2.5%	40@5@2.5%	40@5@2.5%	40@5@2.5%	40@5@2.5%

Putnam.....23¢	21¢	20¢	19¢	18¢
.....30@5@2.5%	30@5@2.5%	30@5@2.5%	30@5@2.5%	30@5@2.5%

Vulcan.....23¢	21¢	20¢	19¢	18¢
.....25¢	25¢	25¢	25¢	25¢

Picture—

Brass Head, Combination list.50@10%

Brass Head, Sargent's list.70@10@70@10@5%

Porcelain Head, Combination list.40@10@5%

Porcelain Head, Sargent's list.50@10@5%

Crown's list.50@10@5%

Niles' Patent.40@10@5%

Improved Bay State.50@10@5%

New Lightning.50@10@5%

Penn.50@10@5%

Perfection.50@10@5%

Reading 72.50@10@5%

Reading 78.50@10@5%

Turn Table.50@10@5%

White Mountain.50@10@5%

Saratoga.50@10@5%

White Mountain.50@10@5%

Baldwin.50@10@5%

Bonanza.50@10@5%

Dandy.50@10@5%

Eureka. 1888.50@10@5%

Family Bay State.50@10@5%

Improved Bay State.50@10@5%

New Lightning.50@10@5%

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Eureka. 1888.50@10@5%

Family Bay State.50@10@5%

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New Lightning.50@10@5%

Penn.50@10@5%

Perfection.50@10@5%

Reading 72.50@10@5%

Reading 78.50@10@5%

Turn Table.50@10@5%

White Mountain.50@1

Slates—(From store).

"D" Slates.....50@10@10@10@5%
Unexcelled Notchless Slates 60@nine 10s.
Victor Slates.....60 and eight 10s and 5%

Slaw Cutters—See Cutters.**Snaps Harness**—

Covert Mfg. Co.:
Derby.....45@2%
High Grade.....45@2%
Jockey.....45@2%
Trojan.....45@2%
Covert's Saddlery Works:
Banner.....75%
Crown.....70%
Triumph.....70%
W. & E. T. Fitch:
Bristol.....40@10%
Empire.....50@5%
National.....50@5%
Clipper.....50@10@5%
Champion.....40@10%
Victor.....60@5%
German.....50@5@5%
Sargent's Patent Guarded.....70@10@70@10@10%

Snaths—

Scythe.....55%

Snips, Tiners—See Shears.**Soldering Irons**—

See Irons, Soldering.

Spoke Trimmers—

See Trimmers, Spoke.

Spoons and Forks—**Tinned Iron**—

Basting, Cen. Stamp Co.'s list 75@10@80%
Solid Table and Tea, Cen. Stamp Co.'s
list.....70@25%

Silver Plated—

Flat Ware.....60@5@60@10@5%
Rogers & Bros.....60%
C. Rogers & Bros.....60%
Wm. Rogers Mfg. Co.....60%

Miscellaneous—

German Silver.....60@10%
C. Rogers & Bros.:
18 per cent. German Silver.....60%
18 per cent. Nickel Silver.....60%
Silver Metal.....50@10%
Wm. Rogers Mfg. Co.:
18% German Silver.....60%
Rogers' Silver Metal.....50@10%

Springs—**Door**—

Champion (Coil).....60@10@50@10@10%
Gem (Coil).....20%
Rubber complete.....# doz. \$15.00
Star (Coil).....88@4%
Torrey's Kite, 30 in., # doz. \$1.10@1.25
Warner's No. 1, # doz. \$1.50, No. 2.....\$3.40
Victor (Coil).....60@10@60@10@5%

Carriage, Wagon, &c.

Elliptic, Concord, Platform and Half
Scroll, 60@10@60@10@10 or fol-
lowing net prices:
Tempered Oil Tempered,
Bkt. Bkt. Bkt. Bkt.
14 in. 514@.....514@.....6@.....8@.....8@.....
14 in. 514@.....514@.....6@.....8@.....8@.....
14 in. 514@.....514@.....6@.....8@.....8@.....
Clif's Bolster Springs.....40@2%
Clif's Seat Springs.....# pair 45%

Sprinklers, Lawn—

Enterprise.....25@30%
Philadelphia No. 1, # doz. \$12; No. 2,
\$15; No. 3, \$14.....35%

Squares—

Nickel plated.....} List May 1, '95.
Steel and Iron,} 75@10@50@25%
Rosewood Hdl. Try Squared T-Bevels
60@10@10@70%

Iron Hdl. Try Squares and T-Bevels
40@10@40@10@10%
Dissiton's Try Sq. and T-Bevels.....60@10%
Winterbottom's Try and Miter.....50@10%

Squeezers—**Lemon**—

Wood, Common, # gr. No. 0, \$5.00;
Wood, No. 1, \$6.50; No. 2, \$10.00.
Wood, Porcelain Lined, No. 1, # doz.
\$2.25@3.50
Tinned Iron,# doz. \$0.80@1.25
Iron, Porcelain Lined, # doz. \$3.25@3.50
Hotchkiss Straight Flash,# doz. \$9.00
Jennings' Star.....# doz. \$1.85@1.90
King.....# doz. \$2.00

Staples—

Barbed Blind, 1/4, 1/2 and 3/4 in., # doz. 514@6%
Fence Staples, Galvanized } Same price
Fence Staples, Plain,} as H'rb Wire
Grand Crossing Tack Co.'s list.....75@10%

Steels, Butchers'—

Dick's.....40%
Foster Bro's.....40%
C. & A. Hoffmann's.....40%
Nichols Bros.....50%
John Wilson's, list Sep. 1, '94.....25%

Steeleys—40@40@10%**Stocks and Dies**—

Blacksmith's:
Buttfield's Goods.....35@40%
Waterfor' Goods.....35@40%
Gardner.....40@10%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plates.....25@30%
Reversible Hatchet.....25%

Stone—**Scythe Stones**—

Pike Mfg. Co., list '95-'96.....35@45%

Cleveland Stone Co., list Nov. '92. 33@45

Oil Stones, &c.

Pike Mfg. Co.:
Hindostan No. 1, # doz. 8@.....
Sand Stone.....5@.....
Turkey Oil Stone, Extra, 33@5@10@
5 to 9 in. 8@.....33@5@10@
Turkey Slips.....8@.....
Lily White Washita.....6@.....
Rosey Red Washita.....6@.....
Washita Stone, Extra.....50@.....
Washita Stone, No. 1.....40@.....
Washita Stone, No. 2.....30@.....
Lily White Slips.....9@.....
Rosey Red Slips.....9@.....
Washita Slips, Extra.....8@.....
Washita Slips, No. 1.....7@.....
Arkansas Stone, No. 1, 31/2@5@in. \$2.50@
Arkansas Stone, No. 1, 5@6@in. \$3.50@

Tanite Mills: Emery Oil, # doz. \$5.00.....50@60%

Stoners—

Enterprise.....25@30%
Cherry—

Stops, Bench—

Cincinnati.....25@10%
Seymour Smith & Son, # doz. No. 1, \$3.50; No. 2, \$3.20

Millers Falls.....15@10%
Morrill's, # doz. No. 1, \$10.00; No. 2, \$11.00, 40@20%

Stearns'.....30@5%
Tatum's.....40%

Stops, Window—

Taplin's.....45%

Stove Boards—

See Boards, Stove.

Stove Polish—See Polish, Stove.**Straps, Box**—

Cary's Universal.....20@10@10%

Stretchers, Carpet—

Cast Iron, Steel Points, # doz. 70@75@

Cast Steel, Polished, # doz. \$2.25

Socket, # doz. \$1.75

Bullard's.....25@10@40%

Stuffers, Sausage—

Bissell: Cincinnati, Cyco Bearing.....\$24.00

Criterion, Cyco Bearing.....\$16.00

Furniture Protector, Japanned.....\$22.00

Furniture Protector, Nickled.....\$24.00

Gold Medal, Cyco Bearing.....\$24.00

Grand, Cyco Bearing.....\$36.00

Grand Rapids, Japanned.....\$22.00

Grand Rapids, Nickled.....\$24.00

Hall, Cyco Bearing.....\$30.00

Improved Crown Jewel, Japn'd. \$19.00

Improved Crown Jewel, Nickl'd. \$21.00

Improved Victor.....\$18.00

Popular.....\$14.00

Premier, Cyco Bearing.....\$24.00

Prize, Cyco Bearing.....\$24.00

Standard, Japanned.....\$20.00

Standard, Nickled.....\$22.00

Superior, Cyco Bearing.....\$24.00

Welcome, Cyco bearing.....\$24.00

Wetckisler Metallic Mouse, 5-hole traps,
doz. 6@; in full cases, # doz. 6@

Hotchkiss Imp. Rat Killer, # gr. \$12.50

Hotchkiss New Rat Killer, # gr. \$12.50

Mouse, Wood Choker, # doz. holes, \$2@96

Mouse, Round Wire, # doz. \$1.50.....10%

Mouse, Sensible.....\$3@33@

Rat Decoy, # gr. \$10.00.....10%

Rat, Sensible.....\$3@33@

Schuyler's Rat Killer, No. 1, # gr. \$18.50;

No. 2, # gr. \$15.00

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Hotchkiss New Rat Killer, # gr. \$12.50

Mouse, Wood Choker, # doz. holes, \$2@96

Mouse, Round Wire, # doz. \$1.50.....10%

Mouse, Sensible.....\$3@33@

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